APR 23 1928

Our Professional Life Requires Wisdom to Know the Good That Pharmacy Can Do; the Service of Our Activities Must Be Linked Up with That of Others—the Headquarters Will Add to Our Opportunities. Prepare for "Convention Week" in Portland, Maine—the Week of August 20th.

Vol. XVII, No. 4 APRIL, 1928

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE SEVENTY-SIXTH ANNUAL CONVENTION WILL BE HELD AT PORTLAND, ME., DURING WEEK OF AUGUST 20, 1928.

The 1928 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries will also be held at Portland, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

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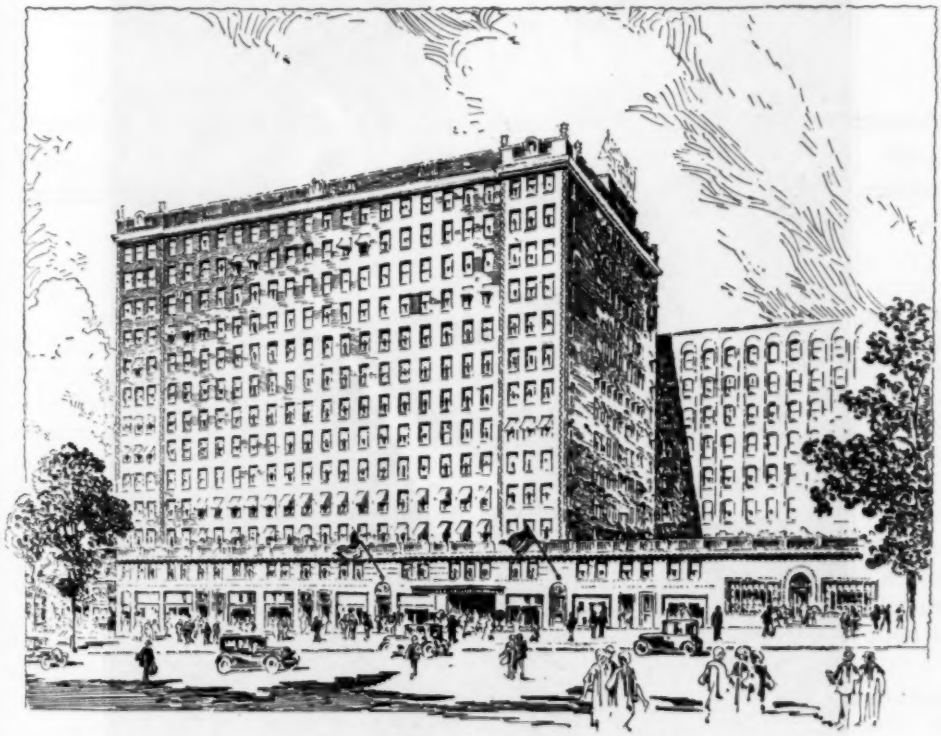
THE SEVENTY-SIXTH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, PORTLAND, ME., DURING WEEK OF AUGUST 20TH.

The time for the 76th annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION is rapidly approaching, hence, the Section Officers are now preparing their programs and you are invited to contribute a paper or papers to the respective sections—the addresses of the Chairmen and Secretaries are given below for your convenience—write them and give them the titles of your papers as early as possible.

Scientific Section.—*Chairman*, L. W. Rowe, % Parke, Davis & Co., Detroit, Mich.; *First Vice-Chairman*, J. C. Munch; *Second Vice-Chairman*, F. J. Bacon; *Secretary*, Paul S. Pittenger, % Sharp & Dohme, Baltimore, Md.; *Delegate to the House of Delegates*, J. C. Krantz, Jr.

Section on Education and Legislation.—*Chairman*, M. N. Ford, 608 High-Long Bldg., Columbus, Ohio; *Vice-Chairman*, W. J. Husa; *Secretary*, A. L. I. Winne, 712 State Office Bldg., Richmond, Va.; *Delegate to House of Delegates*, R. H. Raabe; *Alternate Delegate*, J. J. Grasser.



A. PH. A. Headquarters Hotel—The Eastland.

Section on Practical Pharmacy and Dispensing.—*Chairman*, Adley B. Nichols, 145 N. Tenth St., Philadelphia, Pa.; *First Vice-Chairman*, L. M. Monell; *Second Vice-Chairman*, J. L. Powers; *Secretary*, P. H. Dirstine, College Station, Pullman, Wash.; *Delegate to House of Delegates*, C. M. Snow.

Section on Commercial Interests.—*Chairman*, C. Leonard O'Connell, 1922 Noblestown Rd., Craffton, Pittsburgh, Pa.; *Vice-Chairman*, Denny Brann, 421 Sixth Ave., Des Moines, Ia.; *Secretary*, R. B. Rothrock, 219 Mulberry St., Mt. Vernon, Ind.; B. M. Keene, *Delegate to the House of Delegates.*

Section on Historical Pharmacy.—*Chairman*, W. P. Porterfield, 61 Broadway, Fargo, N. D.; *Secretary*, Ambrose Mueller, 25 N. Gore Ave., Webster Grove, Mo.; *Delegate to House of Delegates*, Charles Gietner; *Historian*, E. G. Eberle, 10 West Chase St., Baltimore, Md.

The A. PH. A. Headquarters site has been selected; contributions and endowments are now sought for the Library and Museum—this presents opportunities for individuals and organizations to perpetuate the memory of pharmacists.

R. LINCOLN McNEIL.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVII APRIL, 1928 No. 4

ROBERT LINCOLN McNEIL.

The President of the American Pharmaceutical Manufacturers' Association, R. Lincoln McNeil, is a native of Philadelphia, the son of Mr. and Mrs. Robert McNeil. He was educated in the public schools of his home city, winning the 1900 free scholarship in the Northeast Manual Training High School; he graduated from the University of Pennsylvania with senior honors and the degree of B.S. in Economics and Business Administration. The business which father and son developed originated as a retail pharmacy and is now one of the large modern manufacturing establishments of the pharmaceutical industry.

President McNeil became a member of the American Pharmaceutical Manufacturers' Association in 1915 and during most of the years since then has served on the Board of Directors and as Chairman of important committees; his election to the presidency is responsive to the recognition of his services and devotion to duty.

Mr. McNeil was one of the organizers of the Kensington Board of Trade and has served on its Board of Directors since and as President from 1916–1919; he is interested in whatever promotes the welfare of the community—he was Vice-Chairman of the Kensington District Liberty Loan and War Chest campaigns; he is now and has been for a number of years Vice-President of the Law Enforcement League of Philadelphia. Mr. McNeil is an Elder and Trustee of the First Presbyterian Church of Germantown and a teacher of its Sunday School; a member of the Masonic Fraternity, Union League and North Hills Country Club. Two sons have added to the happiness of the home of Mr. and Mrs. McNeil.

His success is the result of the energy he gives to his work, after studying and arriving at an understanding of the problems before him. We conclude this brief sketch with a word of commendation and thanks for a recent message addressed to the membership of the A. P. M. A., in which President McNeil spoke in highest terms of appreciation of the valued work of the AMERICAN PHARMACEUTICAL ASSOCIATION and its helpfulness to the drug industries.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

PUBLIC HEALTH BULLETINS.

THROUGH the coöperation with the Surgeon-General of the Public Health Service, Dr. Hugh S. Cumming, a series of Public Health Bulletins will be prepared one or more to be issued monthly.

Public health matters concern every individual, and it is an opportunity for pharmacists, as well as a privilege, to coöperate with public health agencies in disseminating reliable information concerning public health and the great work which is being done by governmental and other agencies for its protection and promotion. Pharmacists are qualified to render a distinct service because of their strategic position and intimate contact with the public.

It is the aim of this service to bring about a coöperative relationship with the Public Health Service to which the Surgeon-General has given hearty encouragement and it is hoped that members will offer suggestions to the end that these contributions may prove a real service to pharmacy and thereby to the public. The first of these articles is by Surgeon-General Cumming on "The Pharmacist and the Public Health," and the second is contributed by Chairman E. Fullerton Cook, of the Committee on Status of Pharmacists in the Government Service, on "The Pharmacist's Responsibility in Community Health."

Some of the Bulletins to be issued will contain messages to the public which may be used as personal bulletins by pharmacists in their places of business, as messages to their patrons or in newspapers, for promoting a better understanding of the service of pharmacy in their respective localities. With your helpful coöperation we hope that this endeavor will contribute to pharmaceutical progress.

E. G. E.

BI-CENTENARY OF ANTOINE BAUMÉ.

ANTOINE BAUMÉ, best known in connection with the hydrometer bearing his name, ranks high among the French pharmacists of the 18th century, who contributed largely to the chemistry of that period. He was born—February 26, 1728—at Senlis, about twenty-five miles distant from Paris, where his father was an inn-keeper. When thirteen years of age Antoine was apprenticed to a pharmacist of Compiegne, a town in which a royal palace of a previous century was rebuilt during the reign of Louis XV; the statement is incidental; however, his acquaintance in Compiegne may have given Baumé a hearing before the King, referred to hereafter.

In 1745 the young pharmacist came to Paris, where he found employment with Claude Joseph Geoffroy, the last of a lineage of pharmacists who had held this business from 1638 till 1762; the employer of Baumé was then about sixty years of age and highly regarded at home and abroad—he was a member of the Academy of Sciences and a fellow of the Royal Society of London; other members of this family were prominent among the scientists of that period. In the Geoffroy

pharmacy Baumé served for six years, in charge of the laboratory. It was during this period that he made application to be received as a member of the Paris Guild of Apothecaries; objections were raised to his admission on account of deficient education and because he had not passed his apprenticeship in Paris. Baumé appealed to the King and, in 1752, was duly enrolled among the master apothecaries of Paris. It was in this year that Geoffroy died, and Baumé opened a shop in the rue St. Denis, opposite the Church of Saint Leu, having been aided financially by Joseph Macquer, Master of Pharmacy and Doctor of Medicine, known for a number of notable chemical discoveries and as director of the royal porcelain factory at Sevres; potassium arsenate was for a long time known as "Macquer's arsenical salt"—"Sal arsenicale Macquer." In 1763, the business which Baumé had founded was removed to rue Coquilliere where a wholesale as well as retail business was carried on.

In 1762, Macquer had started a course of chemistry lectures with Baumé as the demonstrator. These lectures were continued for about twenty-five years and were attended by hundreds of students many of whom, later, honored their preceptors by carrying on the work in which they had become proficient.

In the same year (1762), Baumé's "Eléments de Pharmacie Theoretique et Pratique" appeared and this classic treatise passed through a number of revisions, both English and French. In 1765 he published his "Manual of Chemistry," and in 1773 "Chemie Experimentale et Raisonée." During the latter year he was elected member of the Academy of Sciences, in the place of Lavoisier, who had been created an associate.

Baumé disposed of his business interests in 1784, but in later years he suffered financial reverses and reëntered business as a partner of his son-in-law Louis Margueron, a military pharmacist who, in 1800, opened a retail pharmacy, not far from Baumé's first shop; this partnership continued until the death of the latter, October 15, 1804.

During the more active years of his business life Baumé established a factory for the manufacture of sal ammoniac and devised a process of bleaching silk. He is, perhaps, best known, as previously stated, in connection with the areometer which bears his name; however, as pharmacist he deserves an honored place in pharmaceutical history for his successful efforts in removing many of the traditional superstitions which for a period burdened and afflicted the materia medica with polypharmacal combinations of disgusting ingredients. Baumé contributed largely to the new nomenclature[1] of chemistry proposed by De Morveau, Lavoisier, Berthollet and Fourcroy. He always searched for truth; this and his industry characterized him. Pharmacy claims Baumé as a pharmacist and joins with other scientific and professional organizations in the celebration of the two hundredth anniversary of his birth.

E. G. E.

THE PHARMACIST AND THE PUBLIC HEALTH.

BY HUGH S. CUMMING, SURGEON-GENERAL, U. S. PUBLIC HEALTH SERVICE.

THE usually strategic position and the familiar association of the drug store with medical matters in the popular mind places pharmacists in a position to

[1] JOUR. A. PH. A. (July 1926), 596.

render a material service to the community in connection with public health activities. It is the privilege, as well as the duty, of a pharmacist to coöperate with public health agencies in the dissemination of reliable information concerning the public health, and to assist the constituted public health authorities especially as relates to communicable diseases and the protection of biologic products. It is, therefore, evident that a pharmacist should possess information of wider scope on matters pertaining to the public health than is possessed by the average layman.

Health officers generally have recognized that health education is an important means for promoting public and personal health. Broadly speaking, public health in a given community depends upon the personal health of each individual. To give information on any subject to everyone in a community is a tremendous task, and one that can never be finished. It has no end because new facts are being constantly developed through research and new people are being added to each community through new arrivals and the growth of children to the teachable age. Those who are trying to promote health education for the public have, therefore, the task of imparting an ever-increasing mass of information to an ever-changing population.

The magnitude of such a task, instead of being a cause for pessimism, should be a challenge to persons interested in the public health to develop a plan whereby each community may feel a sense of responsibility for the important task of health education. Members of the profession of pharmacy can play an important part in the matter of health education.

The facts for health education are developed by the laboratory workers, those engaged in scientific research of all kinds, the field workers in epidemiology, the vital statisticians, who keep the record of progress, and those clinicians who are close observers of their patients.

Every person should have a working knowledge of what he should expect in the way of health education from his physician, dentist, pharmacist and nurse, and from the local health organization. In addition to this, he should know what an intelligent and well-organized state department of health may do for the promotion of the health of the citizens of the state, and what may be expected from the Federal Government in the way of health conservation. In order that the pharmacist may measure up to his responsibilities in the matter of the demands for health information, he must, of course, be properly informed with regard to such matters.

The Editors of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION and of the Journal of the National Association of Retail Druggists have kindly offered space in their columns in which public health information may be furnished to members of the profession of pharmacy throughout the country. It is possible that other publications reaching pharmacists will also utilize such information.[1] The Public Health Service is glad to have the opportunity of bringing to the members of the profession of pharmacy, from time to time, matters pertaining to the public health that are of importance or of current interest.

When health information has become more general, we should be near to the dawn of a new era in health education; when the citizen develops a sense of re-

[1] A number have signified their willingness, and speaking from past experience, all of them may be relied upon for their invariable, most helpful coöperation.

sponsibility for his own health he will be in a position to demand competent and adequate service from all health authorities. He will also be in a position to be critical of the kind of service he receives and demand that such service should approximate in efficiency the result which it is possible to achieve with weapons against disease which science has placed in our hands. Then the value of right living and personal hygiene will be understood and appreciated as well as the true benefits conferred by safe water supplies, safe milk, proper disposal of sewage and excreta, the value of birth registration and disease reporting, the control of communicable diseases, and the health promotion value of school hygiene, industrial hygiene and scientific research.

The public, generally, is rapidly awakening to the possibilities of preventive medicine due to the tremendous volume of publicity on health matters that has developed within the past few years. It will be well, however, to remember that the circulation of misinformation by individuals and unrecognized organizations must be avoided. With the development of general interest in public health matters there has sprung up, in certain quarters, an effort on the part of individuals and organizations, for selfish reasons, to disseminate quasi-scientific information that is incorrect, misleading and harmful.

It is, therefore, of great importance that health information and education come from recognized authoritative sources as medical societies, County, State and Federal health agencies, life insurance companies and unofficial specialized health groups.

Through health education each individual will be made to realize the fundamental importance of national health to national happiness and prosperity. He must not only feel that keeping himself in a health condition enables him more than anything else to live a successful, useful and happy life, but that in doing so he is fulfilling one of the essentials of good citizenship.

THE PHARMACIST'S RESPONSIBILITY IN COMMUNITY HEALTH.

BY E. FULLERTON COOK.

CHAIRMAN OF COMMITTEE ON STATUS OF PHARMACISTS IN GOVERNMENT SERVICE, A. PH. A.

INTELLIGENT civilization thinks in terms of "better health" when planning for comfort, happiness and even prosperity.

The number of agencies, public and private, directly coöperating in the maintenance or restoration of health, is startling, and the percentage of expenditures for this purpose, is a large proportion of the cost of living.

Within the memory of many living men and for the past 4000 years, the physician and the pharmacist stood almost alone, shoulder to shoulder, in their struggle against disease.

To-day their efforts are supplemented by a vast number of national, state and local organizations including, in Washington alone, more than one hundred Government Bureaus with substations in every important centre in the United States and its territories and possessions. In addition there are State and City

Health Boards, Food and Drug Administration Bureaus, the Red Cross, Public Health, Nurses' Stations, Tuberculosis Clinics, Baby Clinics, Physical Development Institutions and thousands of splendidly equipped hospitals and sanitariums.

Even the large life insurance companies are urging and freely supplying regular physical examinations for the detection of incipient disease and the popular literature of the news-stand advises and inspires more sane living for better health.

In this gigantic program to advance the health of the nation, what part is being taken by the two original factors in public health promotion? It is time that pharmacy should frankly face this question and adjust its plans, if necessary, to work in full harmony with the scientific, modern forces guiding these most vital activities.

Those controlling the profession of medicine within the field of hygiene, diagnosis, surgery, research into functional and causative forces in normal and diseased tissue and also in applied, organized medicine may be commended for intense activity and notable advance.

In pharmaceutical manufacture, in the establishment of standardized therapeutic agents, in the production of biological products, and in the synthesis of new organic drugs, the pharmacist is progressive and scientific and may be proud of the accomplishments.

Now in this modern program which is not a theory but actually here, what shall be the policy and service which the trained community pharmacist should supply?

Through the working of natural economic laws the pharmacist must find his right place in this development and render a needed service, or automatically he will be eliminated.

First, he must collect, manufacture and standardize in convenient and dependable form those products which have stood the test of clinical and laboratory trial and are known to be valuable therapeutic agents; then he must be trained, equipped and strategically located so that the physician and the public may obtain the prompt dispensing of these medicinals.

Sometimes this service is best rendered in the hospital dispensary, but more often in the pharmacy, privately owned and controlled.

He must also be prepared to supplement the treatment of the physician in the homes of his community by supplying, in addition to prescriptions, those other requisites to modern treatment—sterile solutions, the more simple clinical tests, sick-room supplies, biologicals, etc.

His service to the public directly must also be in harmony with the professional status he assumes when coöperating fully with his physician friends. To maintain this position every one admits the need for excellent judgment and a well-formulated policy, for the temptation to step outside of the legitimate field of pharmacy into that of medicine is constantly presented.

But here is where pharmacy finds its big opportunity to become an important factor in the national public health program. There are more than 50,000 retail pharmacies in the United States; they are strategically located so as to easily reach those who need help. The traditions of the community are such that the first place to go for advice and help in time of trouble is the drug store. Perhaps this is primarily so because it is free, but it would not continue from generation to genera-

tion and become traditional if the type of men in pharmacy during the past had not proved their worth and met the need.

To the pharmacy to-day the people go for help in sickness and in trouble; the potential possibilities for helping and serving are tremendous and pharmacy must not now fail in meeting this confidence with wise and trained advice.

The Charters' report which scientifically studied the demands made upon the practicing pharmacist of to-day, found that everywhere the public go to the drug store for information—it is how to destroy insects, how to disinfect clothing or an out-building, how to pasteurize milk and a thousand questions that have to do with the problems of living. The real pharmacist is the adviser on questions domestic, political, mechanical, postal and hygienic and yes, often, therapeutic.

Here is the real problem! Pharmacy and medicine must ultimately reach the answer to this question.

The pharmacist is not qualified or authorized to recommend medicines for specific diseases. He properly sells simple home remedies, the use of which is common knowledge but there his function in this field ends.

But neither is the physician authorized nor qualified to dispense his own medicines; the best thought in medicine acknowledges that the physician who hands out ready-made pills and tablets in his own office cripples his medical service. Here again there are legitimate exceptions, for the country doctor miles from a pharmacy must of necessity carry his medicines.

Why should not pharmacy and medicine face these issues honestly, study the problem and adopt and promote a code of practice which will insure a program and teaching for the best interest of the public health and that in the long run will surely work for the prosperity and growth of a legitimate and virile practice of medicine and pharmacy?

The proposed coöperation of pharmacy and the Public Health Service, through the combined efforts and publications to be issued jointly by the Surgeon-General and Editor E. G. Eberle, will be a forward step in this directon.

SMUGGLING OF NARCOTICS AND NARCOTIC ADDICTION.

Colonel L. G. Nutt, Deputy Commissioner of Prohibition, in testifying before the House Appropriations Committee, said there was very little diversion of narcotics in legitimate channels, but there is considerable smuggling by ships' crews and through the borderland. He further testified relative to three surveys which had been made in recent years and the estimated number of addicts was about 100,000, but he was convinced there were not that many; "propagandists tell us," he said, "how terrible the menace is and number the addicts anywhere from a half million to four million."

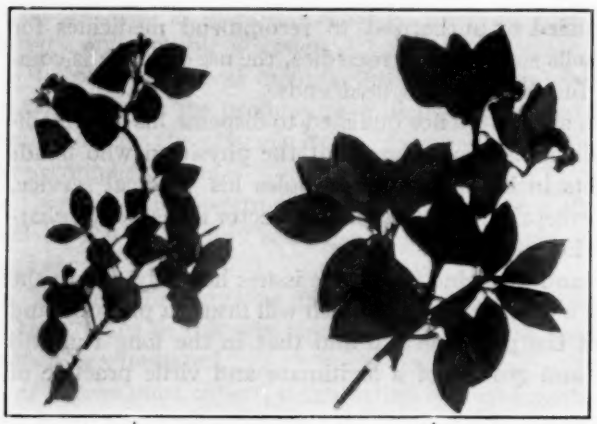
In some instances the desire to get into the lime-light seems to compete with the spirit of helpfulness. The seriousness of the situation is to be deplored and everything should be done to eradicate the evil, but exaggeration, no matter what the purpose, does not help as much as knowing the facts. Narcotics for unlawful supply of addicts are smuggled into the country and handled by unscrupulous individuals, who have no connection whatever with medical practitioners nor with the drug trade. Measures for the regulation of dispensing of narcotics had their inception in the AMERICAN PHARMACEUTICAL ASSOCIATION.

SCIENTIFIC SECTION

VIBURNUM CASSINOIDES, A RECENT SUBSTITUTE FOR VIBURNUM PRUNIFOLIUM.*

BY HEBER W. YOUNGKEN.

About two years ago, while examining a commercial sample of a bark labeled "Black Haw," the writer's attention was attracted to the rather dark colored peculiarity of the specimen which in many other respects resembled what he had been accustomed to recognizing as the root bark of Black Haw or *Viburnum prunifolium* L. He had heard of the adulteration and the substitution of Black Haw with the bark of Shawnee Haw, as first reported by McManus, and determined to obtain some of the substitute bark with a view toward acquainting himself with its characteristics.



Viburnum prunifolium Viburnum cassinoides

Fig. 1.—Branches of Black Haw (*V. prunifolium*) and Withe Rod (*V. cassinoides*) showing leaves and inflorescences.

A short time before receiving the first lot of materials, news came to the writer of the use of considerable quantities of Shawnee Haw or *Viburnum nudum* L. bark by certain pharmaceutical manufacturing houses who regarded it as superior to Black Haw in their preparations.

A problem which at first appeared rather small gradually developed, because of the close natural relationship existing between several species of the genus Viburnum, into an investigation upon which I have continually worked for more than a year.

Two sets of samples were obtained from different sources for purposes of investigation. The first of these sets comprised about 2 oz. of a root bark and 2 oz. of a stem bark labeled respectively, "Shawnee Haw Root Bark (*Viburnum nudum* L.) and Shawnee Haw Tree Bark (*Viburnum nudum* L.). The second set included about 2 pounds each of (1) "A variety of Shonny Haw Root Bark," (2) "A variety of Shonny Haw Tree Bark," (3) True North Carolina Black Haw Root Bark," and (4) "True North Carolina Black Haw Tree Bark." The "Shonny Haw" barks in this set were collected in North Carolina. Not satisfied with the barks, alone, the writer obtained from the collector of this second set representative portions of the root systems, stems and leafy branches of the plants from which the bark had been gathered.

---

* Scientific Section, A. PH. A., St. Louis meeting, 1928.

Upon sectioning and studying representative specimens of each of the barks in the two sets, I found both sets of root bark which were labeled "Shawnee Haw" and "Shonny Haw" identical structurally. This was also the case for the tree or stem barks labeled "Shawnee Haw" and "Shonny Haw" respectively. The Black Haw root and tree barks proved to be authentic specimens.

A comparative examination of the "Shawnee Haw" and "Shonny Haw" root barks with the commercial sample labeled Black Haw showed that these three barks were identical histologically.

The writer next visited the Arnold Arboretum at three different seasons of the year and there collected authentic material including portions of root systems,

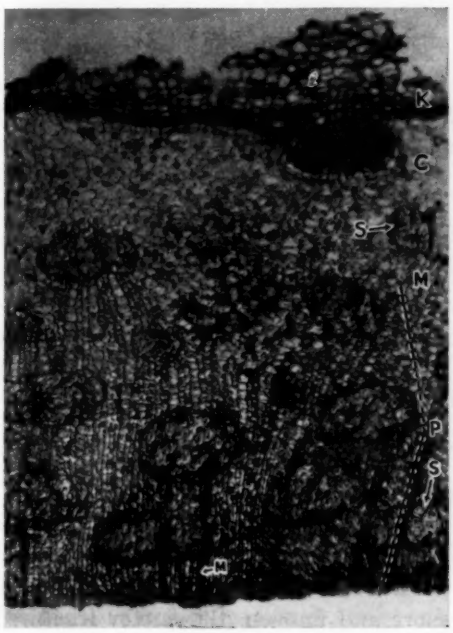


Fig. 2.—Photomicrograph of a cross-section of the root bark of North Carolina Black Haw (*Viburnum prunifolium* L.) *k*, cork; *c*, secondary cortex; *s*, group of stone cells; *m*, medullary ray; *p*, phloem.

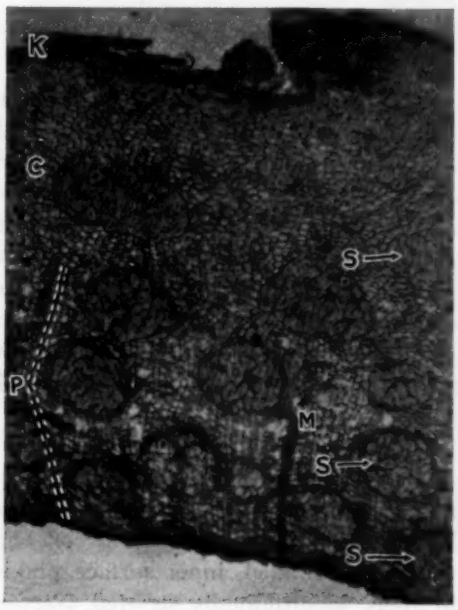


Fig. 3.—Photomicrograph of a cross-section of the root bark of a so-called "variety of Shonny Haw" and identified as *Viburnum cassinoides* L.) *k*, cork; *c*, secondary cortex; *p*, phloem; *s*, stone-cell group; *m*, medullary ray.

stems and leaves, flowers and fruits from a series of living *Viburnum* species including *V. prunifolium*, *V. Lentago*, *V. nudum* and *V. cassinoides*. A comparative macroscopic and microscopic study of the leaves, stems, bark and roots of the material from North Carolina with the authentic material gathered in the Arnold Arboretum showed that the "Shonny Haw plant" was structurally identical with *Viburnum cassinoides* L. of the Arnold Arboretum.

The Shawnee Haw root and tree barks of the first set were also identical structurally with similar barks gathered from *V. cassinoides* L. in the Arnold Arboretum, but differed structurally from authentic samples of root and stem barks taken from *Viburnum nudum* L. growing in the Arnold Arboretum.

To further confirm that the substitute labeled "Shonny Haw" was derived from *V. cassinoides* L., the writer next visited the Gray Herbarium of Harvard University and compared the dried leaves in the material labeled "Shonny Haw from North Carolina" with the leaves on herbarium sheets of *Viburnum cassinoides* L. gathered at Pinehurst, N. C. by Otto Katzenstein and of *Viburnum nudum* L. collected in a swamp at Parksville, N. C. by L. F. and Fannie R. Randolph and found the leaf material designated as "Shonny Haw from N. C." structurally identical with that of *Viburnum cassinoides* L. The dried leaf material was further compared as to its structural characters with the leaves found on a living plant of *Viburnum cassinoides* growing in the Harvard University Gardens at Cambridge, Mass. and found to be similar in morphologic details.

DESCRIPTION OF VIBURNUM CASSINOIDES L.

Viburnum cassinoides L. is a shrub or small tree rising to the height of from 1 to 4 meters. It is found in swamps and wet thickets from Newfoundland to North Carolina and west as far as Minnesota and Manitoba. Its leaves are subcoriaceous, elliptic, ovate, oblong or ovate-lanceolate, up to 10 cm. in length, acute or bluntly acuminate at the apex, irregularly dentate to denticulate and undulate along the margin, dull green on the upper surface which is glabrous or glabrate, paler green on the lower surface, the veins on this surface being scurfy-punctate. Its petioles, twigs and inflorescences are very scurfy. Its inflorescences consist of cymes, 5 to 12 cm. in breadth which are usually longer than the peduncles. The flowers are perfect and white. Its fruits are bluish, ovoid or subglobose drupes containing a flattened stone.

DESCRIPTION OF ROOT BARK OF VIBURNUM CASSINOIDES L.

In irregular, transversely curved or quilled pieces from 0.5 to 3 mm. in thickness and 1.5 to 14 cm. in length, outer surface grayish brown to dark brown or blackish brown, or, where the cork has been scraped off, brownish red, longitudinally wrinkled, inner surface pinkish brown to reddish brown and yellowish in areas, longitudinally striated, fracture short and uneven, the cut or fractured surface showing in bark of medium thickness, a thin, blackish or dark brown cork, a brownish red or pinkish middle bark, and a whitish or brownish red or pale yellowish inner bark in which pale yellow groups of cells may be seen with a hand lens; odor slightly valeric acid-like, becoming more pronounced when the bark is ground and very strongly valeric acid-like, when it is triturated in a mortar with phosphoric acid; taste bitter and astringent.

A 1–100 solution of ferric chloride gave a greenish black coloration to the inner surface of the whole bark.

HISTOLOGY OF THE ROOT BARK OF VIBURNUM CASSINOIDES L.

Under the microscope, this bark exhibits a somewhat lignified cork, a cork cambium, a secondary cortex and a broad phloem. The latter being the broadest region.

Scattered throughout the cortex and phloem are numerous circular to oval groups of stone cells with somewhat scalloped and toothed margins as seen in cross-sections. The stone-cell groups vary in size, but the larger groups predomi-

nate. They appear for the greater part less deeply indented along the margin than the stone-cell groups in the root bark of *Viburnum prunifolium*. The individual stone cells examined varied in size from 20 to 79.2 microns in width to from 40 to 96.56 microns in length.

Numerous rosette aggregates of crystals of calcium oxalate as well as crystal fibers containing rosette aggregates are scattered through the cortex and phloem. Monoclinic prisms of calcium oxalate also occur but are relatively few. The rosette

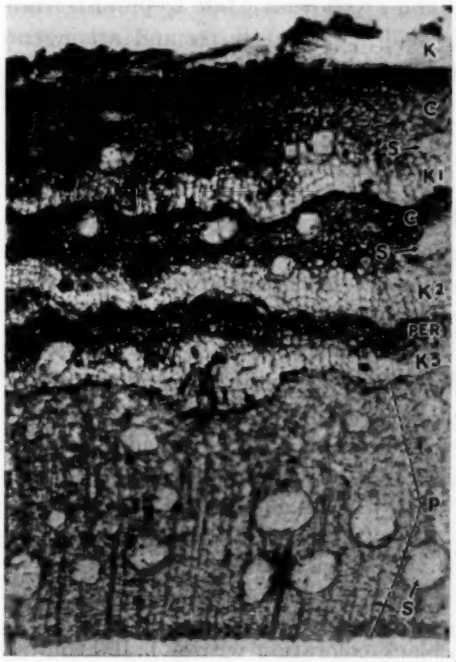


Fig. 4.—Photomicrograph of a cross-section of North Carolina Black Haw stem bark (*Viburnum prunifolium* L.). *k*, cork; *c*, cortex; k^1 and k^2, cork layers formed at successive depths in cortex, and k^3 in pericycle (*per*) as result of activity of cork cambia of secondary origin; *p*, phloem; *s*, group of stone cells. The margins of the stone-cell groups tend to become more deeply notched in both the root and stem barks of this species than in corresponding barks of *V. cassinoides*.

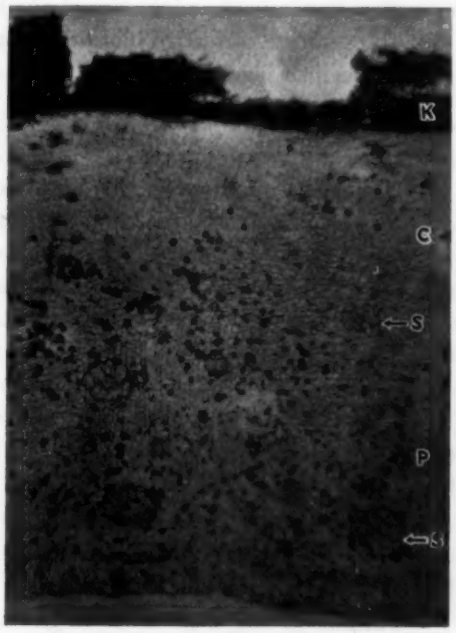


Fig. 5.—Photomicrograph of a cross-section of the stem bark of a variety of the so-called "Shonny Haw" and determined as *Viburnum cassinoides* L. *k*, cork; *c*, cortex; *p*, phloem; *s*, stone-cell group. The black objects in the thin-walled cells of this and other sections figured in this article represent rosette crystals of calcium oxalate.

aggregates are mostly under 40 microns in diameter. The largest one found measured 51.76 microns. The medullary rays are 1 to 3 cells in width.

The parenchyma of the cortex and phloem and the medullary ray cells contain starch grains and a tannin giving a greenish to greenish black coloration with 1–100 solution of ferric chloride. The starch grains are mostly simple, more or less circular, the larger ones being mostly up to 12 microns, a few up to 15 microns in diameter. A few 2 to 3 compound starch grains also occur.

DESCRIPTION OF THE STEM BARK OF VIBURNUM CASSINOIDES L.

In transversely curved pieces, quills or irregular oblong chips, 1.5 to 20 cm. long and from 0.5 to 3 mm. thick, outer surface gray on young stems and showing circular to elliptic lenticels, to grayish brown, blackish brown or black and rough on older stems, reddish brown where the cork is abraded, showing occasional moss and foliaceous lichens, inner surface pale yellowish brown to pinkish or reddish brown, longitudinally striate, fracture short, irregular, showing a grayish to black cork, a greenish phelloderm on young bark, and a yellowish white to pinkish white or yellow inner bark, odor strongly valeric acid-like, taste bitter and astringent. A 1:100 solution of ferric chloride, when applied to the inner surface of this bark, gave a greenish black coloration.

HISTOLOGY OF THE STEM BARK OF VIBURNUM CASSINOIDES.

Under the microscope, this bark exhibits a broad, more or less lignified cork, a cork cambium, a narrow secondary cortex, a broader primary cortex and a phloem. A few scattered groups of stone cells occur in the secondary cortex. Numerous groups of stone cells occur in the primary cortex while smaller and larger groups of stone cells and bast fibers occur in the broad phloem region. While the stone-cell groups are frequently indented along the margin, they are not as deeply lobed and cleft as are many of these groups in the stem bark of *Viburnum prunifolium*. The individual stone cells measured were up to 85 microns in breadth and 146 microns in length. The medullary rays were mostly 1 to 2 cells in width, but a few were seen from 1 to 3 cells wide.

Numerous rosette crystals of calcium oxalate and crystal fibers occur in the cortex and phloem parenchyma. A few monoclinic prisms are also present in these regions.

Tannin, giving a greenish to greenish black coloration with a 1:100 solution of ferric chloride, and a greenish brown resinous substance also occurred in many of the parenchyma cells of this bark.

DISTINCTIONS BETWEEN THE ROOT BARKS.

Viburnum prunifolium:

Outer surface grayish brown to brown, or where cork has scaled off, pinkish brown.

Inner surface reddish brown to yellowish.

Odor valeric acid-like, becoming more pronounced when triturated with phosphoric acid.

Larger stone-cell groups irregularly oblong to ovate and usually with very irregular margins, as seen in cross-sections. More deeply indented.

Medullary rays 1 to 2 cells in width, very rarely, 1 to 3 cells wide.

Viburnum cassinoides:

Outer surface grayish brown to dark brown to blackish brown, or, where cork has scaled off, brownish red.

Inner surface pinkish brown to reddish brown and yellowish, in area.

Odor slightly valeric acid-like, becoming strongly pronounced, when triturated with phosphoric acid.

Larger stone-cell groups circular to oval with somewhat scalloped and toothed margins, as seen in cross-sections. Less deeply indented.

Medullary rays frequently 1 to 3 cells wide, although the 1- to 2-celled type is also found.

DISTINCTIONS BETWEEN THE STEM BARKS.

Viburnum prunifolium:

Outer surface silvery gray on young bark, grayish brown on older bark, or reddish brown where cork has scaled off.

Inner surface yellowish or reddish brown or, yellowish with reddish brown blotches and streaks.

Odor faint to faintly valeric acid-like and only slightly more pronounced, when treated with phosphoric acid.

Stone-cell groups indented along the margin, in many cases, deeply lobed and cleft.

Medullary rays 1 to 2 cells wide.

Viburnum cassinoides:

Outer surface gray on young stems to grayish brown, blackish brown or black, or, reddish brown where cork is abraded.

Inner surface pale yellowish brown to pinkish or reddish brown.

Odor strongly valeric acid-like and very strongly pronounced on triturating with phosphoric acid.

Stone-cell groups frequently with irregular margins, but not as deeply lobed and cleft.

Medullary rays mostly 1 to 2 cells wide, occasionally 1 to 3 cells wide.

When a 1:100 solution of ferric chloride was applied to the inner surface of each of the barks studied, a greenish black coloration resulted, indicating the presence of a tannin, responding in a similar way to that previously found in other Viburnum species.

A comparison of the leaf material of the true Shawnee Haw or Shonny Haw (*Viburnum nudum* L.) with that of the Withe Rod (*Viburnum cassinoides* L.) showed that those of the former are elliptic to ovate to obovate to elliptic lanceolate, 5 to 12 cm. long, entire or obscurely crenulate or undulate with an occasional tooth, broadly cuneate at the base, whereas those of the latter species are elliptic ovate, oblong, or ovate lanceolate, 3 to 10 cm. long, with an irregularly dentate to denticulate and undulate margin and more narrowly cuneate at the base.

Fig. 6.—The true Shonny Haw or Shawnee Haw, (*Viburnum nudum* L.), photographed as growing in the Arnold Arboretum.

The cymes of *V. nudum* were found to be usually shorter than the peduncles whereas those of *V. cassinoides* were usually longer than the peduncles.

MASSACHUSETTS COLLEGE OF PHARMACY.

CASCARA.*

BY T. J. STARKER.[1]

For the last four years the cascara tree has been under the observation of the faculty and senior students at the Oregon State College, and it is the purpose of this paper to summarize briefly the general methods of the industry and the results we have obtained.

Cascara, (*Rhamnus Purshiana*, De Candolle) was discovered on the banks of a tributary of the Columbia about 1805 by members of the exploring party

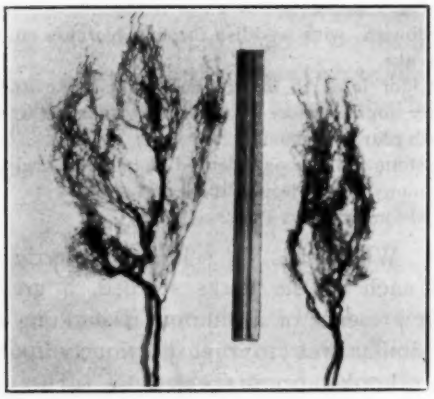
* Section on Historical Pharmacy, A. PH. A., Philadelphia meeting, 1926.

[1] Professor of Forestry, Oregon State College, Corvallis, Oregon.

of Lewis & Clarke. It was first noted on the California coast in 1816 by a Russian naturalist, Eschscholts. It has been grown under cultivation at the Arnold Arboretum since 1873.

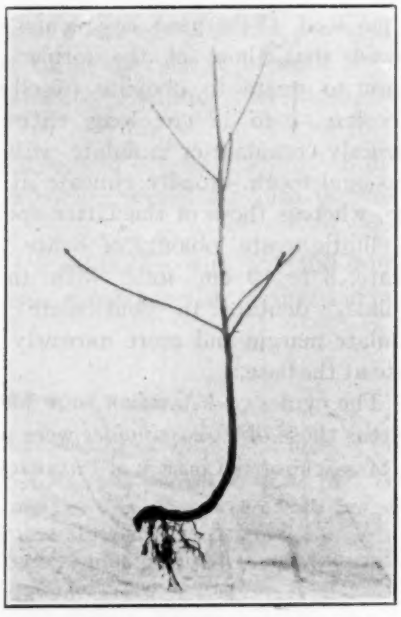
The tree is claimed to have been known since the early part of the nineteenth

View of Oregon State College Cascara plantation.



Root system after 1 year in transplant bed.

Animal damage to sprouts.



New Cascara plant from Layering.

century to the Mexican and Spanish priests of old California. It was known by the Spanish name "Cascara Sagrada" (sacred bark), so named because the wood was supposed to be identical with the "Shittim" or "Chittim" wood used in the Arc of the Covenant. The same wood was also said to have been used for dowel pins in the construction of King Solomon's Temple.

The diameter of the average cascara tree is about six inches, twelve inches being rare. In height the tree seldom exceeds 60 feet; with approximately half this altitude the rule. The normal yield per tree is about 25 pounds of green bark.

On account of the scattered and remote growth of the species, the industry is followed by few persons and only the expert and experienced collector is able to wrest a livelihood from the business which, on account of peeling conditions is only profitable in late spring and early summer.

PROPERTIES.

The American Indians were the first to teach the properties of the bark, the gathering of which differs in no essential aspects from the methods of the original homesteaders sixty years ago. The tree looks much like common white alder and favors most lowlands, cut over timber lands and stream margins, persisting commonly with species of fir, hemlock and spruce.

Prof. Justin Powers, of the School of Pharmacy, Oregon State College says, "Although species closely related to it have been used as cathartics from a very early date, it is only within comparatively recent times that Cascara Sagrada has come into general use. Among the related species which it has largely replaced are *Rhamnus cathartica* and *Rhamnus frangula*.

Without doubt Cascara Sagrada was first used by the American Indian from whom its virtues were learned by the Spanish priests of old California. Since being introduced to the medical profession in 1877, there is probably no single drug which so quickly attained popularity as did Cascara Sagrada. That this popularity was deserved is shown by the fact that it is still held in high esteem and has in a large measure replaced several similar drugs of our materia medica.

The first publication concerning the medicinal value of Cascara Sagrada was that of Dr. J. H. Bundy of Calusa, California in 1877. To Parke, Davis & Co., of Detroit, belongs the credit of first offering a legitimate preparation of the drug to the medical profession immediately following Dr. Bundy's publication.

The extended use of Cascara Sagrada during a period of over fifty years, and numerous investigations have not resulted in a definite determination of the chemistry of its active constituents. In this field lies an unusual opportunity for research.

For the treatment of habitual constipation due to the lack of functional activity of the intestine or lack of digestive secretions, Cascara Sagrada has no peer. It is said to be more active and more certain in its action than any one of the closely allied species which are used similarly. In the use of most laxatives, gradually increasing doses are necessary to produce their effect, but this is not true of Cascara Sagrada. It not only increases the secretions of the gastro-intestinal canal, but, due to its bitter principle, it acts as a tonic, improves the appetite and digestion, and prevents the constipation which usually follows the use of similar drugs. In fact so marked are those characteristics that the dose may be gradually diminished and finally discontinued without the return of constipation.

PLANTINGS.

In 1914, experimental work on the planting of Cascara was started at the Canadian Experimental Station of the Dominion Department of Agriculture at

Sidney, on Vancouver Island. Unfortunately, the area which the trees occupied was needed for other purposes and the planting was later destroyed before satisfactory data on its growth under cultivation could be obtained.

Several small plantings in the Willamette Valley have been started, principally, by nurserymen. It should prove interesting to watch the development of these young seedlings under cultivation. To date they have been growing very well and in 12 or 15 years the trees should be large enough for peeling.

The Forest School has successfully transplanted wild stock and has also produced plants from seed and layers. Thus far cuttings have been a failure.

About 1/4 acre of seedlings are now growing nicely in the Forest Arboretum near Corvallis.

PEELING OPERATION.

A tree is "spotted" and if small is peeled standing, otherwise it is peeled as high as the operator can reach and then felled for the easy removal of the remainder. A lateral incision is made in the bark with a sharp knife, then by means of a thin metal spud, usually made from an auto spring leaf, the bark is cleft from the trunks and limbs. The strips are then placed in gunny sacks and carried on the peeler's back to a horse trail, where the sacks are placed upon animals' backs and conveyed to drying grounds.

Drying consists of exposing the raw bark to the sun's rays on wooden platforms or canvas spread upon the ground, which prevents mold. During the rainy months the bark is dried under shelter.

The bark is then reduced to chips, usually by hand, although recently several motor breakers have been installed in the region. After reducing to chips they are sacked and ready for sale.

Good peelers under favorable conditions can peel from 100 to 250 pounds of dry bark per day, and with a price of from 10¢ to 12¢ per pound, have been known to make twenty to thirty dollars per day.

MERCHANDISING.

The first buyers are usually local warehousemen who in turn sell to pharmaceutical house agents, the material moving to water or rail transportation. The commercial Cascara is then ready for shipment to the world markets. London, England, is the largest single purchaser of Cascara, about 1200 tons yearly finding its way to this market, and thence to other European cities. From 5,000,000 to 7,000,000 pounds on the average are cut annually in the coast ranges of Western Oregon, Washington and California. A much smaller amount being produced in British Columbia, the only other place where this tree grows in commercial quantities.

FUTURE.

Dealers and forestry officials who have studied the methods practiced by the industry, prophesy the end of the crop within a few years if the present conditions continue. According to Government estimates in 1922, over 500,000 trees were peeled.

Each year it is necessary to gather from the more remote and inaccessible areas to meet the increasing demands. Areas are already being peeled over for

the second and third time. This second and third peel is said to come from trees that were too small to yield heavy enough bark at previous cuttings. The trees peeled to-day are much smaller in the aggregate than trees peeled twenty or thirty years ago.

One means of lengthening the life of the industry would be to find a satisfactory method using more of the tree.

In view of the fact that the thinner bark yields the highest per cent of constituents, it may be possible and profitable in the future to grind up the smaller twigs and limbs for extraction of the contents. This process would permit of much closer utilization, and should make the growing of the tree on a commercial basis more profitable.

CHINESE BOTANICAL SOURCES OF EPHEDRINE AND PSEUDOEPHEDRINE.*

BY B. E. READ AND J. C. LIU.[1]

After the very illuminating note upon the botanical sources of ephedrine by Holmes (7) it appears quite clear that the European source of these alkaloids is not the same as the Chinese Mahuang as was assumed by Chen and Kao (3). A private communication from Merck's assures us that contrary to recent statements (2) their European supplies are yielding ephedrine and only a small amount of pseudoephedrine. Various publications from these laboratories (4) show that ephedrine and pseudoephedrine (12) occur in Chinese Mahuang. Hence it is plain that there are good sources for these two alkaloids in both Europe and Asia.

The work of Neilsen, *et al.* upon American ephedras confirms our results (14), namely that California ephedra contains no ephedrine nor pseudoephedrine. We found a small amount of a basic substance in the Nevada species which we should like to try out further.

The article published by Neilsen (10) dealing with Chinese species of *Ephedra* shows the great need for definite identification and classification of the Chinese plants. The purpose of this paper is to provide this as adequately as possible.

Material has been sent by us to Dr. O. Stapf, the world's authority upon *Ephedras*. His well-known monograph (16) sets forth the characteristics of the various species quite clearly. It is now definitely known that the material collected and sold as Mahuang consists chiefly of *Ephedra sinica*, Stapf, an entirely new species described by him (17) from incomplete material in the *Kew Bulletin*.

This plant we have made unusual efforts this year to personally collect in numerous out-of-the-way places, and to secure it from remote areas through friends. We have now obtained plenty of complete material providing the male, female and flowering plants, which come from the exact areas where the drug collection is made. This plant grows abundantly in North China particularly on the mountains running up through Shansi, Northern Chihli, and around the edge of the Mongolian plateau down to the sea near Peitaiho. At the latter place Cowdry (5) listed *Ephedra equisetina*, Bunge, in 1922. This species is quite common in

* Received for publication December 15, 1927.

[1] Department of Pharmacology, Peking Union Medical College, Peking.

Shansi and is known as "Mupen Mahuang," *E. sinica* being called "Tsaopen Mahuang." A third species collected by Eriksen in Mongolia was sent by us to Stapf, who pronounces it to be another new species. Holmes' (7) assumption that the species sold in Peking is *E. intermedia var. Tibetica*, Stapf, is not supported by the facts as they are so far known. For the flowering plants sent by us to Stapf are an entirely new species. It is probable that all of the above-mentioned species, not *E. intermedia*, are sold, and that *E. sinica* is the commonest in the Peking drug market.

We herewith give a detailed description of the two plants, *Ephedra sinica* and *E. equisetina* both of which grow in great abundance along the T'ai-Hang-

Fig. 1.

Fig. 2.

Fig. 1.—*Ephedra equisetina*, Bge. *A-I*, female flower or fruit (about natural size); *J-N*, male flower (about natural size). *A-B*, female spike with 4 pairs of bracts; *C*, the same with bracts separated, *C-5* flower with exserted micropyle and entire perianth; *D*, perianth split open; *E*, ovule with micropyle; *F-G*, mature fruit; *H*, the same with bracts separated, showing one seed inside; *I*, seed with both surfaces convex. *J*, male spike; *K*, the same with bracts separated; *L*, androeceum in perianth; *M*, stamen with anther-sacs, front view. *N*, back view of the same.

Fig. 2.—*Ephedra sinica*, Stapf spec. nov. (about natural size). *A*, female spike; *B*, the same with bracts separated and showing the 2 flowers or fruits in the last pair of bracts. *C*, male spike; *D*, perianth with calyciform bract; *E*, the same opened—*b*, the bract, *p*, the perianth; *F*, anther-sacs (8) and stamen; *G*, the same, torn apart; *H*, seed, showing the flat side; *I*, seed, showing the triangularly convex side; *J*, female flower.

Shan mountains, which follow north along the Great Wall of China and south through Shansi, marking the provinces of Chihli, Shansi, Shensi, Kansuh, Jehol, Chahar, Suiyuan, Honan and Hupeh. The area covered is shaped like a letter T and is defined by its terminations in the two Kuans and the two Kous, Shanhai-kuan, Chia-yü-kuan, Chang-chia-kou and Hankow, see Fig. 5.

Both of these plants yield ephedrine and pseudoephedrine (12) (13), and both show great seasonal variation. The best yield is from the green stems of the E. equisetina collected in October which contained 1.75 per cent as compared with 1.32 per cent in E. sinica. The berries (15), roots and woody stalks do not contain ephedrine.

EPHEDRA EQUISETINA, BGE.

I. *General Characteristics.*—Plant 1–2 m. high; stem woody; branches cauline, longitudinally striated; much branched, 2-3 branchlets whorled at node; internodes 1–3 cm. mostly,

and 4 cm. rarely; in general less than 1 mm. thick; flower sessile or sub-sessile, axial at nodes; female spike solitary, or 2 opposite or decussate; male spikes 3–5 glomerated.

II. *Leaf.*—Reduced to sheath at nodes; brownish purple; membrano-coriaceous; almost entirely or only slightly fissioned with a ring at base; 2 mm. in length; closely surrounding the branch or branchlet.

III. *Male Spike.*—Axial, sessile or very slightly sub-sessile; 3–5 flowers glomerated at node; each flower is 2 mm. each way, and consists of 4 pairs of bracts, arranged decussately—the lowest pair being sterile; each calyciform bract subtends a pair of membranous sheaths, the perianth, in which is enclosed the stamen with 7 or 8 anthers; the perianth is 2 mm. each way; the anthers are so arranged that the inner surface appears flat, while the outer one is convex; the filament is 0.5 mm. long.

IV. *Female Spike.*—Axial, sessile or sub-sessile, peduncle when present is 2.5 mm. long; mostly 2 flowers opposite or decussate at node, or merely solitary; the flower is 7 mm. long, and 3 mm. wide; the peduncle is subtended by a pair of bracts or sheaths, united $^2/_3$ of the way; above this, there are 3–4 pairs of bracts, arranged decussately, all sterile, except the top pair, which encloses one flower in an entire perianth sheath; each bract is 4.5 x 2–2.5 mm., the lowest pair being slightly smaller; the micropyle is 3 mm. in length, 2 mm. being exserted; the ovule is 0.5 mm., and the pedicel 0.5–1 mm.

V. *Fruit.*—When mature, red and fleshy; 9 mm. long, 5 mm. thick with a short pedicel, which is 1.5 mm. or so long; 3 pairs of bracts, the middle one, being the least fissioned; *1 seed* is enclosed in the topmost pair of bracts.

VI. *Seed.*—Coat hard; purplish; ovate, one side more angularly convex than the other; 7 mm. long, 3 mm. wide, and scarcely 2 mm. thick.

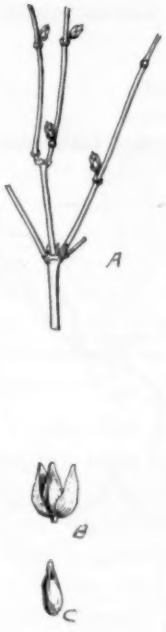


Fig. 3.

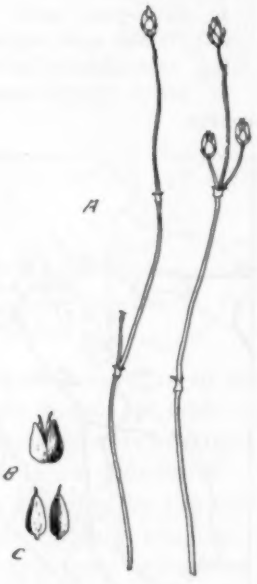


Fig. 4.

Fig. 3.—*Ephedra equisetina*, Bge. *A*, branch, showing axial flowering spikes, smaller leaf-sheaths, relative shorter internodes and much branched branchlets; *B*, 1-seed in spike; *C*, seed: both surfaces convex.

Fig. 4.—*Ephedra sinica*, Stapf. *A*, branch, showing terminal flowering spikes, larger leaf-sheath; longer internodes, and not much branched; *B*, 2-seeds in spike; *C*, seed: one surface flat, the other triangularly convex.

EPHEDRA SINICA, STAPF, SPEC. NOV.

(Mahuang.)

I. *General Characteristics.*—Plant 30 cm. high; branches radical and simple, *i. e.*, rarely further branched; somewhat flat and longitudinally striated; internodes 3–5 cm., rarely below 2 cm.; 1–1.5 mm. thick; flowering spikes terminal, or at upper nodes; solitary.

II. *Leaf.*—Membranous sheath; whitish at tip and reddish purple at base; more or less fissioned; 4 mm. in length, loosely surrounding the branch at node.

III. *Male Spike.*—4 x 3 mm.; terminal or at the uppermost 1 or 2 nodes; consisting of 4 or 5 pairs of bracts, the lowest pair always sterile; the bracts are arranged decussately, the 2 middle pairs the largest; each fertile bract subtends a pair of perianth sheaths, in which is enclosed a stamen with 7 or 8 anthers.

IV. *Female Spike.*—Terminal or at the uppermost 1 or 2 nodes; 3–4 pairs of thick brownish bracts arranged decussately, only the topmost pair, being fertile, encloses 2 flowers.

V. *Fruit.*—Red and fleshy when mature; *2 seeds* are enclosed in the uppermost pair of bracts.

VI. *Seed.*—Coat hard; purplish; one side flat, while the other is triangularly convex; 5 x 3 x 1.5 mm. for the length, width and thickness of the seed, respectively.

COMPARISON OF EPHEDRA EQUISETINA WITH EPHEDRA SINICA.

Ephedra equisetina.	*Ephedra sinica.*
1. *Stem.*—1–2 m. high; woody.	30 cm. high; herbaceous.
2. *Branch.*—Cauline and much branched; up to 1 mm. thick; round; internodes 1–3 cm.	Radical and slightly branched; more than 1 mm. thick; somewhat flat; internodes 3–5 cm.
3. *Leaf.*—2 mm. long; reddish purple; membrano-coriaceous; closely surrounding the branch at nodes.	4 mm. long; whitish membranous above and brownish purple below; loosely surrounding the branch at node.
4. *Spike.*—(*a.*) axial.	Terminal or at upper nodes.
(*b.*) female spike uniflowered.	Female spike, 2-flowered.
(*c.*) male spike 3–5 glomerated.	Male spike, solitary.
5. *Seed.*—1 in the female spike; both sides convex.	2 in the female spike; 1 side triangularly convex, the other flat.

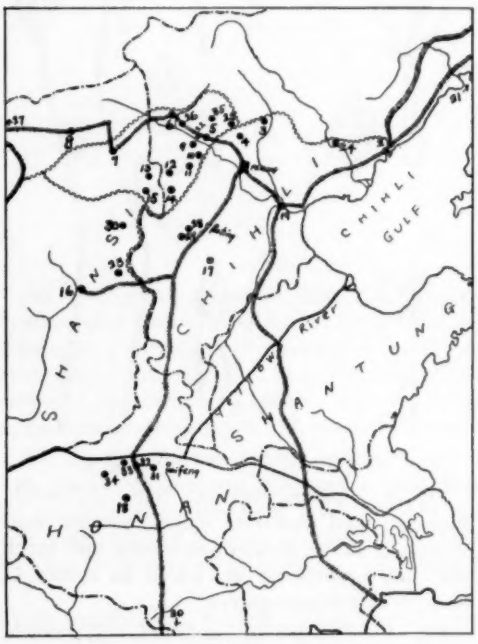


Fig. 5.—Natural Habitat of Ephedra in China. (The numerals refer to the names of places in the text.)

THE HABITAT OF EPHEDRA IN CHINA.

(The numerals refer to places in the map.)

I. *Ephedra sinica,* Stapf, spec. nov. (syn. E. mahuang, Liu) has been collected by us in the following districts in the Chihli province: Kalgan (6), Peitaiho (1), vicinity of Shanhaikwan (2), Huai Lai (5), Fan Shan (10), Ta T'ung (7), Sui Yüan (8), Hsiao Wu T'ai Shan (11), Shuang Shu Tzu (9) and near Hsin Pao An (22).

The same species has been collected and sent to us by drug dealers from Yen Ch'ing Chou (35), Ku Pai K'ou (3), Hsi Feng K'ou (24), Yung Ning (25), and Pao T'ou (27), Hsüan Hua Fu (26) Yü Hsien (12).

II. *E. equisetina,* Bge. has been found by us in T'ai Yüan Fu (16) of Shansi.

The same species has been sent to us through drug dealers from the following districts on the Chihli-Shansi border: Ling Ch'iu Hsien (15), Kuang Ling Hsien (13), Kuang Ch'ang Hsien (14), Yü Hsien (12), another Yü Hsien (23), Ta Wu T'ai Shan (30), Ku Pei K'ou (3), Wan Hsien (28), T'ang Hsien (29), Kalgan (6), Hsuan Hua Fu (26), and Yen Ch'ing Chou (35).

The chief market-places for Mahuang are: Ch'i Chow (17), Tientsin (19), Hankow (20), Newchuang (21), and Cheng Chow, Honan (32).

In 1885 exported Mahuang amounted to 966 piculs from Newchuang, 213 piculs from Tientsin, 66 piculs from Hankow, and 31 piculs from Ningpo. These figures give some indication of the extent to which Mahuang grows in these or nearby areas.

According to Pen Ts'ao Kang Mu, the Chinese Materia Medica, Mahuang is produced in Chung Mou (31), and Jung Yang (33) in Honan. At present, it is reported that Mahuang is still found in these two places, as well as in Sung Shan (34), and Yü Chow (18), of the same province.

Bretschneider's (12) translation also quotes the occurrence of this plant in Tsingchou, E. Shantung, and in P'eng ch'eng, Kiangsu. Also that the drug from Szechuan is of an inferior quality. An entirely different species is reported from Western China, concerning which we

have no chemical or physiological data. Su Kung (7th cent.) said that it grows plentifully in Chengchou (32); Lu t'ai (unknown); Kuan chung, Shensi; Sha yuan, Shensi; on the banks of the Yellow River and sandy islets.

A study of the known geographic distribution of ephedra reveals the fact that heretofore this very important area yielding Mahuang has been entirely overlooked, Fig. 6. It is in no sense a rarity, but owing to its mountainous character

Fig. 6.—Geographical Distribution of Ephedra. (The dots indicate localities where found. The hook mark in Asia indicates a locality not reported before.)

and the lack of good communications in China little has been known about it. Moreover botanical material has only too often been limited to isolated male or female plants, and the tiny bract-like leaves are too insignificant to afford marked distinction between one species and another, without other gross differences.

The general histology of the stem of *E. sinica* has been described by Liu (8).

The Crude Drug Ma Huang.—Read and Feng (13) have carefully examined the gross material and give the chief points of difference between these two species as far as the weight, length and number of internodes, of the green stems is concerned. The *green* stems are the only part used in medicine. Old yellow stems are considered worthless.

The woody branches of *E. equisetina* are useless and make the separation of the stems a troublesome matter. In spite of the fact that this species shows from the green stems a better yield of alkaloid and a larger relative and absolute percentage of ephedrine the difference is not so great as to make it preferable for the Chinese druggist, who can by one blow of an axe sever the green stems of *E. sinica* from the useless woody parts of the root. It is quite clear that Neilsen has had both of these varieties to deal with.

The roots are useless for making ephedrine. *E. equisetina* with its excessive wood sometimes shows a large woody root as thick as a man's arm. In both species the roots are very long. This summer many of the small *E. sinica* dug out from the side of banks were traced for more than a yard. In Chinese Medicine by the bipolar theory, namely that the root has an action opposite to the leaves and branches, Mahuang root is used in the treatment of profuse sweating. Fujii (6) obtained a new base from these roots.

The aroma of fresh Mahuang is quite characteristic. Our experience agrees with Neilsen's report (10), that the penetrating aromatic odor remains during the

entire process of extraction and is quite pronounced in the isolated alkaloid, and its salts. This we have noticed for a very long time and regarded as characteristic of ephedrine compounds, until by exposure to the air for several days we found the aromatic body readily volatilized leaving what is accurately described by the N. N. R. (11) as an *odorless* compound.

Collection of the drug in the autumn before the winter frost, has been shown by us to be essential to a good yield of the alkaloid, there being a difference of 300 per cent between spring and autumn (13).

SUMMARY.

Mahuang has been identified definitely as *Ephedra sinica*, Stapf, and *Ephedra equisetina*, Bunge.

These common species of Ephedra are collected in hitherto botanically unrecognized areas on the Tai-hang-shan mountains from Shanhaikuan in North Chihli, along the Mongolian border and down through Shansi.

Characteristics of both varieties are fully described and illustrated, especially as they relate to the more important uses of the crude drug.

E. equisetina, known as Mupen Mahuang, is very woody and luxurious, and has a high content of ephedrine when collected in the autumn.

E. sinica, known as "Tsaopen Mahuang," is herbaceous and more convenient for collection, and has a good ephedrine content.

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MEDAL TO COMMEMORATE ACHIEVEMENTS OF EDISON.

Proposed legislation authorizing a medal commemorative of the achievements of Thomas A. Edison was approved March 29th, by the House Committee on Coinage, Weights and Measures.

The Committee voted a favorable report on the Perkins resolution (H. J. Res. 243) authorizing the appropriation of $1000 for a medal to be struck by the Department of the Treasury and providing for duplicate medals to be sold under regulations prescribed by the Secretary of the Treasury.

Information filed with the Committee showed that in the course of his career Mr. Edison has applied for 1328 patents and the monetary value of industries entirely based on the Edison inventions, or which have been materially stimulated by his inventions, was estimated at $15,599,000,000.

APPARATUS FOR THE DETERMINATION OF VOLATILE OIL.*

J. F. CLEVENGER.[1]

The principle of steam distillation is the basis of the methods commonly used in obtaining the volatile oil from plant products. This is carried out either by passing steam through a suitable vessel containing the plant material and condensing the steam or by boiling the material with water in a suitable vessel, distilling and collecting the distillate. The volatile oil is carried over with the steam and condenses with it. Being only slightly soluble in water, it subsequently separates from the aqueous portion of the distillate in layers. Boiling methods have been applied by Duvel, (4) Thörner, (5) and Bidwell and Sterling, (6) in the determination of moisture in various materials.

A method for the determination of "volatile ether-soluble extractive" in drug products is described in the United States Pharmacopœia (1), the National Formulary (2), and the Methods of Analysis of the Association of Official Agricultural Chemists (3). The "volatile ether-soluble extractive" is commonly considered the equivalent of the volatile oil. In this method the drug is extracted with anhydrous ether, the solution is evaporated, and the residue is dried at room temperature and weighed. The residue is then heated to 110° C. until the weight becomes constant and weighed. The difference in weight represents the "volatile ether-soluble extractive." The method is more or less empirical and is subject to several criticisms. (*a*) The loss in weight does not always represent the volatile oil that usually is the desirable or active constituent, but it may include volatile materials resulting from the decomposition of unknown substances; (*b*) the prolonged heating of the residue at 110° C., which is necessary to remove the volatile matter completely from the ether-soluble extractive, increases the possibility of decomposition with subsequent erroneous results;[2] (*c*) the volatile constituents of the product in question are not available for subsequent examination, which is desirable in many instances.

An apparatus for the determination of volatile oil has been devised which provides for a direct reading of the quantity of volatile oil obtained and makes it available for subsequent examination, such as for the determination of the specific gravity, optical rotation, index of refraction, and possibly minimum boiling point. It permits in most cases a direct quantitative determination of the volatile oil of most plant products without preliminary extraction with ether or other solvents.

APPARATUS.

The apparatus (Figs. 1 and 2) consists essentially of three parts: (*a*) A round-bottomed flask, in which are placed the material containing the volatile oil and a given quantity of water; (*b*) a separator, in which the oil is automatically separated from the distillate in a graduated tube, thereby permitting a direct reading of the quantity of the oil; and (*c*) a convenient condenser. The size of the flask

* Scientific Section, A. PH. A., St. Louis meeting, 1927.

[1] Pharmacognosy Unit, Drug Control Laboratory Food, Drug and Insecticide Administration, Washington, D. C.

[2] The boiling temperatures of most of the fractions of the volatile oils are much above 110° C.

may vary from 100 cc. to approximately 2 liters, depending upon the nature of the material and the percentage of volatile oil present. The quantity of the material taken should be such as to obtain, if possible, from 1 to 3 cc. of volatile oil. The flask should not be heated by a direct flame on account of the danger of charring the material containing the volatile oil, thereby giving erroneous results. An oil-bath heated electrically or by a suitable gas flame has been found satisfactory for this purpose.

APPARATUS FOR THE DETERMINATION OF VOLATILE OIL.

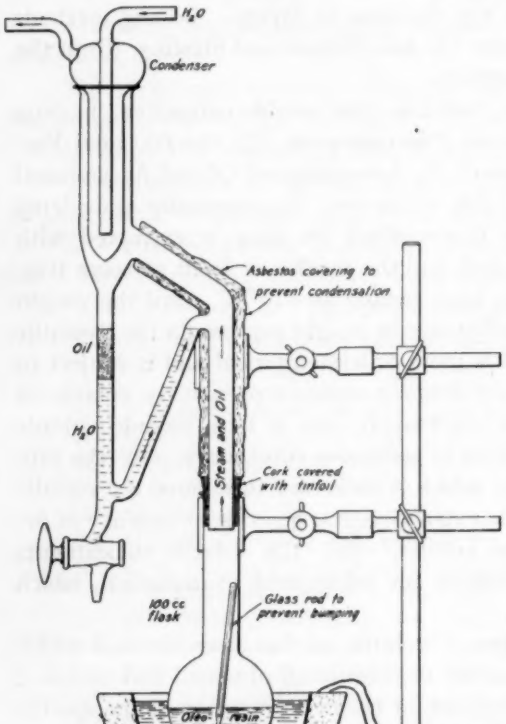

Fig. 1.

TYPES OF OIL SEPARATORY TUBES

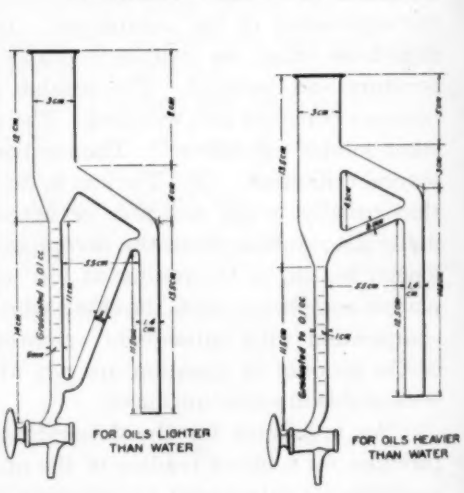

Fig. 2.

METHODS FOR THE DETERMINATION OF VOLATILE OIL.

(*a*) *For Plant Products Containing Little or No Starch or Mucilage.*—If the material consists of roots or thick products, place a suitable quantity of the coarsely comminuted material in a flask of suitable size and add water until the flask is half full. Leaf-like material may be placed directly in the flask without first being comminuted or ground. Set up the apparatus as indicated in Fig. 1. Boil the contents for approximately two hours, or until all of the volatile oil has been driven

off. The steam carrying the volatile oil condenses and falls into the graduated tube of the separator. The water is separated from the oil by gravity and automatically flows back into the distillation flask. It has been found that a small amount of paraffin added to the flask prevents excessive foaming which occurs especially in case of powdered products. (Care must be taken that the distillation be conducted at a rate sufficiently slow to prevent the escape of vapors around the condenser, thus insuring against loss of volatile oil.)

(*b*) *For Crude Material Containing Considerable Starch or Mucilage.*—Exhaust a weighed amount of material with a suitable solvent (alcohol or ether) in an automatic extractor. Transfer the extract to a suitable flask and evaporate the solvent, using a current of air, on a slowly simmering steam-bath until the odor of the solvent is no longer detected. Proceed as outlined in (*a*).

(*c*) *For Fluidextracts Containing Volatile Oil.*—Transfer a given quantity of extract to a suitable flask and evaporate as outlined in (*b*) and, after evaporation, proceed as outlined in (*a*).

A number of volatile oils having a specific gravity slightly greater than that of water, for example clove oil, will slowly settle in water. Such oils cannot be determined directly by the use of the separator for oils lighter than water (Fig. 2). Attempts have been made to render the same apparatus serviceable for oils heavier than water by adding a given quantity of a volatile solvent lighter than water and immiscible with it directly to the separatory tube before beginning the determination and making appropriate corrections for the added solvent. The volatile solvent which has been added to the separator before beginning the experiment must be removed from the volatile oil before the constants can be determined directly on the oil. The results obtained from experiments by this procedure were not considered satisfactory by the writer.

In order to overcome the difficulty encountered and to obtain a volatile oil unmodified by other solvents, an apparatus has been devised for oils heavier than water (Fig. 2). The graduated tube of the separator extends below the return flow tube, thus facilitating the separation and permitting a direct reading of the quantity of the volatile oil. Some difficulty is frequently experienced in obtaining a complete and satisfactory separation of the volatile oil, owing primarily to the surface tension of the two liquids. This may be overcome for the most part by occasionally agitating the liquids in the separator with a suitable wire. Any error due to the necessary use of this wire is believed to be negligible and within the limits of experimental error.

DETERMINATION OF CONSTANTS.

The volatile oil obtained may be finally transferred to a test-tube (10 x 75 mm.) and allowed to stand until perfectly clear (over night is usually sufficient) or it may be dried at once with a suitable dehydrating agent, such as anhydrous sodium sulphate, and filtered. The index of refraction may be determined by the usual method. In spite of the small amounts of volatile oil usually obtained (0.75 to 1.5 cc.), the determination of the optical rotation may be made in a 50-mm. micropolarizing tube and the specific gravity may be determined in a Sprengel specific gravity bottle of approximately 1-cc. capacity. The minimum boiling point may be determined by the method described by Smith and Menzies (7). In

this method the volatile oil is introduced into a small glass bulb, approximately 5 mm. in diameter, from which a bent capillary tube, approximately 6 cm. long, extends. The volatile oil is introduced into the bulb by immersing the end of the capillary tube in the oil in question and applying a small flame to the bulb for a short time. This causes the air in the bulb to expand and escape from the end of the capillary tube. Upon cooling the bulb, the volatile oil enters. The bulb thus approximately half filled with oil is attached to a thermometer and immersed in a molten paraffin-bath. The paraffin-bath is gently heated until bubbles of the volatile oil freely flow from the end of the capillary tube. The heat is then removed and the bath is allowed to cool until the level of the paraffin in the capillary tube becomes level with the volatile oil in the bulb. This temperature is noted and regarded as the minimum boiling point for the volatile oil.

COMPARISON OF THE UNITED STATES PHARMACOPŒIA METHOD WITH THE PROPOSED METHOD.

In order to compare the United States Pharmacopœia method for the determination of the volatile ether-soluble extractive (usually considered the equivalent of the volatile oil) with the proposed method for the determination of volatile oils, experiments were carried out with several different materials. The results obtained are given in Table I.

TABLE I.—VOLATILE ETHER-SOLUBLE EXTRACTIVE BY U. S. P. METHOD AND THE VOLATILE OIL BY NEW METHOD.

Substance.	Volatile ether ext. by U. S. P. method. Per cent by wt.	Volatile oil by new method. Per cent by wt.
[1]Clove (buds)	18.1	16.3
[1]Oregano, Monterey (leaves)	3.1	2.8
[1]Ginger (oleoresin)	25.5	23.9
[2]Ginger, Jamaica (rhizomes)	1.2	1.1
[2]Ginger, Jamaica (rhizomes)	1.4	1.4
[2]Ginger, African (rhizomes)	2.9	2.2
[2]Ginger, African (rhizomes)	3.0	2.4
[3]Ginger, Cochin (fluidextract)	1.7	1.5
[3]Ginger, African (fluidextract)	3.0	2.4

[1] Volatile oil determined by method (a).
[2] Volatile oil determined by method (b).
[3] Volatile oil determined by method (c).

The yields of volatile matter obtained by the official method were in general somewhat higher than those obtained by the new method. It is believed that the results by the new method more nearly represent the correct percentage of the volatile oil available in the product. There is a possibility that these results may be a little low on account of the slight solubility of the oil in water.

PHYSICAL CONSTANTS OF VOLATILE OILS GIVEN IN THE U. S. PHARMACOPŒIA AND PHYSICAL CONSTANTS OF SIMILAR OILS OBTAINED BY THE NEW METHODS.

As the boiling method is not the method usually employed for obtaining volatile oils, the physical constants of these oils may differ from the physical constants of similar oils recognized as standard in the U. S. Pharmacopœia. Experi-

ments were conducted with several materials in order to compare the physical constants given in the U. S. Pharmacopœia for a number of volatile oils with the constants determined on similar oils freshly obtained with the apparatus described above. The results obtained are given in Table II.

TABLE II.—PHYSICAL CONSTANTS OF VOLATILE OILS GIVEN IN THE U. S. P. AND PHYSICAL CONSTANTS OF SIMILAR OILS OBTAINED BY THE NEW METHOD.

	Physical constants (U. S. P.).			Physical constants (determined). Spec. grav. 25° C.		
Material.	Specific gravity.	Optical rotation.	Refractive index.	25° C.	Opt. rot.*	Ref. ind.*
Nutmeg (seed)	0.859–0.924	+12°–+30°	1.4780–1.4895	0.874	+30°	1.480
Caraway (fruits)	0.900–0.910	+70°–+80°	1.4840–1.4880	0.904	+73°	1.485
Eucalyptus (leaves)	0.905–0.925	±10	1.4600–1.4690	0.912	+6°	1.464
Fennel (fruits)	0.953–0.973	+12°–+24°	1.5280–1.5380	0.963	+18	1.529
Clove (buds)	1.038–1.060	Does not exceed −1°–10′	1.5300–1.5350	1.053	−0.6°	1.533
Orange (peel)	0.842–0.846	+94°–+99°	1.4723–1.4737	0.844	+95°	1.471**

* Room temperature, approximately 24° C.

** Within U. S. P. variation recognized as occurring in distilled oil.

These results show that the constants obtained on these volatile oils are within the limits given in the U. S. Pharmacopœia for similar volatile oils.

ACKNOWLEDGMENT.

The author wishes to express thanks to Mr. L. J. Schwarz for valuable suggestions, to Mr. R. M. Baker, for the drawings and to Mr. W. B. Symonds, for making the apparatus.

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THE BOYCOTT OF SPANISH ERGOT.

BY H. H. RUSBY.

In the *Second Annual Report of the Pharmacological Laboratories of the Pharmaceutical Society of Great Britain*, page 10, occurs the following statement regarding their assays of extracts of ergot, "prepared by the method of the United States Pharmacopœia."

"An important practical conclusion was reached that, whereas most samples of Spanish or Portuguese ergot contain a fair proportion of the specific alkaloid, samples of Russian and Polish ergot are uniformly deficient."

Gittenger and Munch, of the U. S. Dept. of Agriculture, have reported that 26 of 27 samples of Spanish ergot were equal to or above U. S. P. requirements and 6 Portuguese samples were the same, while 3 of 5 from Poland and 7 of 9 from Russia, were below U. S. P. requirements.

The representative of a German firm that makes a specialty of the manufacture of *ergotamine*, now regarded as the principal active constituent of ergot, recently informed me that they were unable to produce this alkaloid from Russian ergot in any paying quantity.

Some weeks ago, in my office, a gentleman representing a combination of certain drug dealers, pharmaceutical manufacturers and pharmaceutical journals, said to me "We have succeeded in preventing a market for Spanish ergot."

Beyond saying that this declared boycott of Spanish ergot is part of a dollars-and-cents competition among commercial interests and their sponsors, I shall here confine myself to the indisputable facts regarding the comparative characters of Spanish ergot and any other kind that is available to American manufacturers.

My knowledge of this subject has been very intimate and extensive for more than a quarter of a century. I have examined and approved or condemned train-loads of ergot, in the aggregate, and cannot plead ignorance regarding the subject here discussed. Either the statements are true, or I am deliberately misleading the readers of the JOURNAL.

Of all the lots of Spanish ergot that I have ever examined, I believe that I have never seen one that did not comply with the present requirements of the Pharmacopœia. It is true that in earlier years there was no biological test, but there is no reason to believe that any ergot meeting the other requirements will fail to meet this test, properly applied. I have no doubt that inferior lots of Spanish ergot exist but this must be very unusual, as I have never seen them. Practically all ergot other than Spanish (including Portuguese) that is offered here, is Russian (including Polish), although much has gone out through other countries, including Spain, in order to give it a fictitious standing. Some of the worst of it is said to have gone from this country, after being rejected by the Government, been "fixed up" on the other side, under instructions from our own importers, and successfully returned to this country. I have seen Russian ergot of fair quality, but never actually good, and only rarely fair. An account of the characters of these two products follows, but at this point, I desire to secure the attention of the reader to the full force of the claim that the Spanish ergot has "been deprived of a market" here, in view of my introductory quotations.

Spanish ergot is uniformly collected, cleaned and picked over with scrupulous care, is dried as the Pharmacopœia directs and stored by special devices to keep it dry and unchanged. It is packed and shipped, usually in lined cases, so as to exclude all dampness, and it arrives in perfect condition. Moreover, it probably is not true of this ergot, as stated in the U. S. P., that it is "unfit for use if kept more than a year," though this is true of Russian ergot, long before the expiration of the year.

To describe Spanish ergot would be merely to quote the text of the U. S. P. It is true that worms are occasionally found in it, but it is certainly "as free as practicable" from animal matter.

The collecting, cleaning and picking over of Russian ergot is subject to the

carelessness and uncleanliness that characterize the Russian peasant. Many grains of nonergotized rye are always contained, and a still larger number of "immature" grains, that is, grains that have become only partially ergotized. So far as my experience goes, it is never properly dried and is often apparently shipped without any drying whatever. I have received it so wet that it seemed as though it had been dipped in water to increase its weight. It is almost invariably packed in bags which are permeable to dampness, and also to various impurities and to insect invasion. Under these conditions, certain processes of deterioration begin immediately. The interior of the mass heats and ferments. The fat decomposes and rancidity develops. The whitish fracture may become brownish and the texture may become soft, even mushy, and an offensive odor develops. The damp and heated state is very favorable to the hatching of ergot worms and to the multiplication of mites, known as "lice." The worms, forming their cocoons, produce the "webby" ergot. The lice appear in incalculable numbers. Each is as small as a minute speck of dust, but they frequently cover the entire surface of the grains so as to give them a gray-brown color. Hundreds will be upon a single grain. They become brushed off and accumulate in the bottom of the bag, where I have found them by the quart. More or less moldiness is always present, sometimes so excessive as to cause the grains to cling together in a damp gray mass.

Such is the ergot—practically the only ergot—that will be used by the American people, if the boycott of the Spanish product is not stopped, and its success is being promoted by one of the most powerful combinations that I have ever seen at work in the pharmaceutical world, and is receiving strong journalistic support. It must be a very bad case of mental strabismus that refuses to accept such testimony as that which I have quoted in my introduction.

The condemnation of such ergot is found in the U. S. P. itself, which says there must be "no moldiness" and that the ergot must be "as free as practicable from insect material," that it must be free from rancidity or abnormal odor, and that it must meet various other physical requirements, none of which are met by other than Spanish ergot. If it does not meet all these requirements, the Pharmacopœia, on page 4, specifically forbids the making of preparations from it. In addition to all the other defects named, the Russian ergot offered during the latter part of 1927, or a large part of it, has been held back by the Soviet government for one or more years, to await higher prices. This alone excludes it from admission, because the Pharmacopœia says that it is unfit for use if kept for more than a year. Kept under the conditions above described, there is no question that it is unfit. It is now reported that the Soviet government has forbidden the export of the recent crop, until the old stock shall be disposed of.

In order to deceive and mislead Government officials, a regular business has grown up in New York City of "re-conditioning" it. It is brushed and scoured so that its moldiness is not seen unless one looks into the grooves, or beneath the surface. It is dried, winnowed and sifted so that most of the animal matter is removed. So skilful have these artists become that they have proudly boasted that "ergot cannot be so bad that we cannot fix it so that it will pass inspection." What they cannot do, however, is to restore the lost alkaloid or remove the objectionable probably toxic decomposition products that have formed.

The unenlightened reader may wonder how even a nominal defense can be made of such practices. It is to be found in the fact that among the other U. S. P. requirements is one that the fluidextract must darken the cock's comb when tested as prescribed. Since the Pharmacopœia says "Preparations shall be made only from drugs meeting the physical descriptions and tests," it is clear that there should not be any fluidextract made from such ergot as I have described, but the fact is that the practice has grown of disregarding every other requirement except this one. Things have even gone so far that when the fluidextract does not show the required strength, the official formula is changed so as to use a larger amount of drug to produce the liter of fluidextract! And the defense for this is that it is not yet proved that a fluidextract that darkens the comb is not necessarily active therapeutically!

That physicians should take little interest in this matter is not surprising. Not one in a thousand of them knows the difference between grains of ergot and licorice drops, and too few of them are observant of the effects of the medicine when administered. But with the pharmacist, the case is very different. He is directly responsible for the merits of a fluidextract used in a prescription, regardless of whether it is of his own manufacture or not. With the knowledge that *ergotamine* cannot be extracted in quantity from Russian ergot, and that the British Pharmacopœial Laboratories have found it "uniformly deficient in the specific alkaloid," and that the U. S. Department of Agriculture have found that 10 out of 14 samples of Russian ergot were without appreciable activity, American pharmacists should recognize that their own interests, quite aside from those of their customers, are endangered by a continuance of the determination of certain American manufacturers to "prevent a market for Spanish ergot," and compel the use of the Russian article, in plain violation of the Pharmacopœia and the statutes.

CARE OF ANIMALS FOR BIOLOGIC ASSAYS.

(*Continued from p. 257, March* Jour. A. Ph. A.)

BY PAUL S. PITTENGER.

FROGS.[1]

Distinction of Batrachians from Fishes and Reptiles.—"The Batrachians represent a Class of Vertebrate animals occupying a position between Fishes and Reptiles. There is considerable variation in general appearance among the different living members of the Class, so that a Batrachian is not as easily defined and identified as is a fish, a bird or a mammal. There is no one characteristic by which it may be known, as there is in each of these other Classes."

Two Orders of Living North American Batrachians—Urodela and Salientia.—"The living North American Batrachians differ enough to allow classification into two distinct Orders, the Urodela and the Salientia. The Urodela are the Tailed Batrachians, or Salamanders, with various popular names, such as Mud Puppies or Water Dogs, Tritons, Newts and Efts. The Salientia are the Tailless Batrachians, *i. e.*, the Toads, Tree Frogs, Frogs and all Batrachians that have the frog-like form."

[1] Quotations from "The Frog Book" by Mary C. Dickerson.

Development and Metamorphosis.—"The North American representatives of the Salientia deposit the eggs in water, usually in shallow, stagnant water. The eggs may be laid singly or in small cluster, as in the case of some of the tree frogs; in large masses, as is the habit among the frogs; or in long unbroken strings, as in the case of toads. The eggs are sometimes free in the water, but more often are attached to water-weeds or other objects. If free, the egg mass has such buoyancy that it floats at the surface of the water (*Rana sylvatica*)."

"The egg is spherical, and is provided with a large amount of light-colored yolk. When the eggs are first laid, part of this yolk can be seen occupying the lower portion of the egg under the more or less pigmented upper portion. The dark pigmented portion of the egg at the top (later the whole surface becomes black or brown in color) allows a greater absorption of the sun's heat than would a lighter color."

The time required for the development of the frog's egg varies with the species and with the temperature in case of a given species. The eggs of the Rana pipiens hatch in two to three weeks.

"The length of life of the tadpole before its change into the frog may vary from two or three weeks to as many years. Some of the interesting points possible to observe during the metamorphosis are the following: The arms and legs develop simultaneously, but the arms are concealed under the opercular membrane. The horny parts of the mouth are dropped and the mouth cavity increases in size. The tail becomes smaller by absorption from within. The tadpole takes on habits of rushing to the surface or of resting wholly out of the water, showing that the lungs, which for some time before had been functional in company with the gills, now take on all of the respiratory work (except that performed by the skin)."

The Families of the Salientia or Tailless Batrachia.—"The Tailless Batrachia of North America, as far as known, are represented by seven families, containing together twelve genera and fifty-six species."

Frogs belong to the family *Ranidæ*.

"The family contains a large number of genera, and it is very widely distributed. Australia, New Zealand, and southern South America are the only parts of the world not possessing representatives of the true frogs. Some two hundred species (by far the largest number) are found in the tropical portion of the Eastern Hemisphere. North America has only one genus, Rana; there are seventeen known species, the one form of the rank of a sub-species (*Rana c. latiremis*). They are most numerous in the eastern part of the continent, though several species are found west of the Sierra Nevada Mountains."

The official species, used for the assay of the cardiac stimulants, is *Rana pipiens* Shreber commonly known as the Leopard Frog, Spring Frog and Grass Frog.

The color of the official leopard frog is green, grey or brown, with somewhat rapid change from one color to the other.

"The Leopard Frog is one of the most beautiful in coloring of all our common frogs. It is better known than others not only because of its wider distribution and greater numbers, but because it has the habit of going considerable distances from its pond, or marsh."

Frogs of about $2^1/_2$ inches in length are the proper size for assay purposes.

Age of Leopard Frogs.—The age of a leopard frog may be approximately

estimated from its body-length. The average body-length of the official leopard frog is as follows: One year old, one and one-half inches; two years old, two inches; three years old, two and one-third inches and four years old, two and three-quarters inches.

Sex.—The sex of the frog may be distinguished as follows: The male leopard frog has the thumb of the forefoot much enlarged on the inner edge and has a vocal sac between each ear and shoulder. These vocal sacs can be demonstrated by seizing the frog around the waist just in front of the hind limbs and alternately squeezing and relaxing the pressure. In this way the male will inflate the sacs.

The ripe *females* are very gravid and swollen and have no vocal sacs and no enlarged thumbs.

When disturbed frogs jump for safety. The jump is ofttimes accompanied by the squirting of water. This habit of squirting water—as though in the face of the enemy—may sometimes result in protection to the frog, since the water is of disagreeable odor.

When the frogs are removed from the tank for assay purposes each individual animal should be held until it has finished squirting water before being weighed.

The slipping skin, the slender body and the strong hind legs make it difficult to hold a frog. He gives most unexpected and vigorous jerks of the body to free himself. They are most easily held by firmly gripping about the posterior part of the body and thighs.

Temperature and Hibernation.—"All Batrachians, like Fishes and Reptiles, are cold-blooded, *i. e.*, they have a variable body heat, depending on the temperature of the environment. In this they are distinguished from Birds and Mammals, which have an unvarying body temperature.

"Because of this variation of the body temperature with that of the surroundings, Batrachians can endure extremes of heat and cold, but are greatly influenced by them. With decreasing temperature the processes of respiration and circulation gradually slacken speed, and the animals become more and more lethargic until they sleep. With rise of temperature to a limit varying from 20° to 30° Centigrade in the different species, they gain increased activity."

Shipping.—There are several methods of shipping frogs. Some dealers ship in wet boxes without moss or hay. Others ship in wet moss. The author has found, however, that a large percentage of the frogs die during shipment if not properly crated. The method of packing should be governed by the temperature at time of shipment. *In the very hot summer months* they should be placed in boxes with wet moss. The one side of the box should be covered with fly screening. Care should be taken not to use too much moss as this mats and kills the frogs. The greatest loss of life occurs when too many frogs are placed in a single box or compartment. In such cases the frogs and moss mat in one corner of the box which kills a large number of the animals. Not more than 30 frogs should be shipped in one box or compartment. The most satisfactory method is to divide the box into compartments holding 30 to 35 frogs each, *loosely packed* with wet moss. *During the winter months* frogs may be packed as described above for shipping short distances. For shipping long distances they should be packed in loose moist (not wet) soil covered with about four inches of hay. *The hay must not be wet.* Do not ship more than 40 or 50 frogs in one box or compartment.

"Members of the *Salientia* can endure an astonishing amount of cold; even freezing in the water of a pond or in the mud at its bottom will not of necessity cause death. The circulation and all life processes may stop, but if the blood and protoplasm of the heart do not fall much below freezing point, the frozen parts will recover. Since sleep is induced in specimens at varying temperatures below 10° C., it is easy to understand why Batrachians are not found in the extreme north."

"This hibernation or sleep induced by cold continues until a return of high temperature."

Frogs that become frozen during shipment may, in many cases, be revived and used for assay purposes. Frozen frogs, however, should not be placed in a tank of water to "thaw out" as this rapid thawing usually kills most of them. Frozen frogs should be placed in a cold place where they will thaw out gradually. If this procedure is followed very few of the frogs will die unless they have been frozen for too long a period of time.

Food.—"The frog's method of eating is attended with much nervous alertness, and sometimes with unsatisfactory results to the frog. The food consists, in general, of living worms and insects, which are seized and swallowed alive. The frog uses his hands to help put the food into his mouth. The mouth has the sense of touch highly developed, but the sense of taste is present in only small degree. *In all cases, movement of a small living object gives the visual stimulus, and, psychologically speaking, brings to the frog the suggestion of something to eat.* Long experience of the race has taught that only immediate and swift motor response will result in capture of the food—the miller or grasshopper may take wing, the slug disappear under a board, or the caterpiller roll into a ball and "play dead." Usually, the result of the immediate seizure of the moving object is satisfactory, since *almost all small insects and worms are part of a toad's or frog's menu.* But sometimes lack of examination of the object brings dire results. Such is the case when a large stag beetle is swallowed. Its huge pinching mandibles produce terrible effect at once in the frog's stomach. Fortunately, the frog has a wide, short oesophagus, so that any disagreeable object may be disgorged immediately.

If frogs pursued their prey in the water as do fishes there would be no particular need for a tongue, and some of the most aquatic frogs of the world have little or no tongue as a consequence. Most frogs, however, possess a thick, adhesive protrusible tongue, which is fastened at its forward end. The posterior end of the tongue can be shot forward and then quickly retracted with the prey affixed or held.

It is not necessary, however, to feed frogs which are being stored for testing purposes. Feeding is very difficult and unsatisfactory, so it is better to keep them under conditions where very little energy is used. When stored at the comparatively low temperature of 15° C. or below, as directed by the U. S. P., frogs are quite inactive and require practically no food. It is necessary, however, to supply running water from which they presumably obtain sufficient nourishment.

Storage.—Frogs should be stored in tanks supplied with running water maintained at a temperature of 15° C. The tank should be so constructed that the depth of the water is about one-half inch deep over one half of the bottom and about four inches deep over the other half.

The tank should be divided into several compartments so different lots of frogs may be kept separated. This is essential owing to the variation between different lots in their susceptibility to Ouabain.

The sides and bottom of the tank should be thoroughly scrubbed with a small brush at least twice a week.

Diseases.—The most common and deadly disease of frogs is known as red-leg. This was originally thought to be an infectious disease. It is no longer considered as such but is explained as being a capillary condition produced by too much activity under unnatural conditions or to other unfavorable conditions under which the frogs are kept. There is apparently no cure for the disease and all animals in which red-leg is noted should be immediately removed from the tanks and discarded.

GOLD FISH.

Carassius Auratus.—The Golden Carp more commonly known by the name of Gold Fish owing to its golden hue, is a native of some of the ponds and sluggish streams of China. In their native waters, however, they are more of a silver color and do not have the bright golden coloring which is common to our usual aquarium varieties.

The Chinese breeders, who have for many centuries devoted all of their skill to breeding fine specimens, are to a great extent responsible for the much admired, bright golden red color.

Gold fish are classified according to shape as Common Gold Fish, Japanese Fan Tails, Japanese Fringe Tails, Comets and Telescopes. Fine colors are found in all the classes—golden red, silver, white, black and amber. These colors are often beautifully variegated.

HOUSING.

The aquarium may consist of any water-tight vessel. Its shape is of little importance. The size depends upon the number of fish to be kept and whether or not the aquarium is supplied with aquaria plants or running water.

In aquaria without plants or running water a half gallon of water should be allowed for every fish of medium size. If the aquarium is supplied with growing plants one gallon of water is sufficient for four fish. If running water is supplied the number of fish per gallon of water may be greatly increased.

Aquaria without running water should not be placed in the sun as the water becomes warm and unsuitable for fish. Another objection to too much sunlight is that it accelerates the growth of algae.

Plants for the Aquaria.—If running water is not supplied, the aquarium should contain an abundance of aquaria plants. These plants in the presence of light, exhale oxygen which is required by the fish to maintain life. If the number of fish is not in excess of four to the gallon of water and there are plenty of aquaria plants present the water need not be changed except when it becomes necessary to clean the aquarium which should not exceed two or three times a year.

Various plants are suitable for growing in aquaria. The most common of these are the Umbrella Plant or Syperus, Colomba or Aquaria Moss, Ludwigia, Lemma or Duckweed and Sagitaria.

If plants are to be placed in the aquarium the bottom should be covered to a depth of about $^1/_2$ inch with well-washed sand. This should be covered with

a layer of clean pebbles and a *few* shells. It is not advisable to use too many shells as the lime hardens the water.

After adding water to a depth of about 2 inches the plants should be inserted into the sand and weighted down until roots grow sufficiently to hold the plants in position.

Scavengers.—The properly stocked aquarium should contain some scavengers to consume decaying vegetable matter, and keep down as much as possible the growth of confervae. Snails, tadpoles and newts are used for this purpose. Snails and tadpoles subsist largely on the growing plants in the water but newts should be fed scraped raw beef, earth worms or insects.

Water.—Ordinary "tap" water, spring or well water is best. Cistern or distilled water should not be used. The temperature of the water should be kept at about 60° to 75° F.

Feeding.—The best food for gold fish is the rice flour wafer or the mixed food containing dried meat sold under the name of Prepared Fish Food and Prepared Mixed Fish Food, respectively.

Fish kept in running water may be fed raw beef or chopped fish worms. All food containing yeast such as bread, crackers, etc., must be strictly avoided. Care should be taken not to overfeed. A piece of the prepared food $^3/_4$ inch square per day is sufficient for a medium-sized fish.

Diseases.—Very little is known about the diseases of fish but salt water has been proven to be a specific for many fish diseases. Salt water apparently acts as a tonic which by invigorating the fish enables it to throw off the disease.

The usual treatment for a sick fish is to place it in a shallow dish containing a solution of one teaspoonful of salt to a quart of water. When the fish floats at the surface from exhaustion (usually after about two minutes) it should be removed to a small aquarium or other vessel containing a solution of one teaspoonful of salt to one gallon of water. Repeat the above treatment with the stronger salt solution daily until the fish has apparently recovered.

Among the common diseases of fish are the so-called fungus, asphyxia, twitters, dropsy and bladder complaint.

As only the common cheap variety of fish are used for laboratory purposes it is more economical to discard fish afflicted with any of these diseases than to spend time trying to treat them.

GUINEA-PIGS.

The Cavy, more commonly known as the Guinea-Pig is a native of South America and belongs to the rabbit family.

The first white explorers of South America found that the Indians had domesticated the Cavy. Besides being used for food purposes they were kept as household pets.

The wild Cavies of South America are still hunted as game and considered a delicacy.

Although guinea-pigs are used as food and as pets, they are in demand in far greater numbers for laboratory purposes.

The most satisfactory size for testing purposes is from 250 to 500 Gm. which size they attain in from six weeks to six months. Full-grown guinea-pigs, however, weigh from 675 to 1400 Gm. Their growth is comparatively rapid as they attain approximately their maximum size in about eighteen months.

The origin of the name guinea-pig is apparently unknown. Some think it is perhaps due to the fact that their shape suggests a small pig and that the name Guinea is a corruption of Guiana, a country in South America.

There are three principal varieties of Cavies distinguished mainly by their fur—the English, Abyssinian and Peruvian.

The Abyssinian and Peruvian are long ruffied-haired fancy breeds. The English or short smooth-haired cavies are the ones generally used for laboratory purposes. They come in a variety of colors, such as black, brown, cream, white, silver, gray, brindle, fawn or a mixture of these colors. The whites are usually albinos and have pink eyes.

Housing.—The size and style of the guinea-pig cage or cages depends primarily upon the number of animals to be housed. In our laboratory we keep these animals in multiple cages of the type shown in Fig. 3. Each unit of this cage accommodates about 25 pigs. While the animals are under test we use cages of the type shown in Fig. 1. Two to four pigs, of different color for identification purposes, are placed in each cage. The small cages are very serviceable as they may easily be carried into the laboratory where the animals are weighed and injected with the preparations to be tested.

The cages must be kept *dry* and clean. Guinea-pigs can stand low temperatures if the cages are dry and the animals are not in a draft. On the other hand they die rapidly if kept in a draft or wet cages.

The trays of guinea-pig cages should be covered with sawdust to a depth of about $^1/_2$ inch to absorb moisture. On top of this a bedding of about three or four inches of hay should be placed. If the animal house is not heated during the winter months the hay helps protect the animals from the cold. At all seasons of the year the pigs will eat a considerable portion of the hay and the coarser parts make good litter.

The trays should be emptied at least twice a week and washed with an antiseptic solution before filling with fresh sawdust and hay.

In unheated houses the cages should be covered, during extremely cold weather, with burlap. This keeps out all drafts and at the same time allows sufficient air for breathing purposes.

Feeding.—Hay, grain and green foods form the principal diet for guinea-pigs. Hay should be before them all the time. Grain should be fed daily during the winter but sparingly in summer. Green food should be fed the year round and varied as much as possible. Of the grains, oats is the best although bran, wheat or rye serve the same purpose.

Guinea-pigs will accept almost any kind of greens such as grass, young wheat, alfalfa, clover, green corn stalks, melon rinds, apple peelings, cabbage, celery, kale, etc. Carrots and beets may also be classed as green food.

Green food should be fed sparingly during the winter and plentifully during the summer. *All green food must be in good condition.* Spoiled, sour, musty or moldy food will kill a large number of pigs. Decayed portions of green foods should be carefully removed before feeding.

Lettuce, celery and beet tops are among the doubtful foods. Too much of these greens seems to kill the animals. Also never feed grass or young wheat after it has been frosted or when it is wet with dew.

Do not overfeed as this is apt to cause bowel trouble. Do not feed at one time more green food then the pigs can eat in an hour. They are not apt to overeat hay but will eat too much green food if it is kept before them all the time. Best results are obtained by feeding twice a day—morning and evening.

Water.—Water should never be given while feeding green foods. When feeding only hay and grain, water is necessary. Change water daily.

Breeding.—Most laboratories find it more convenient and cheaper to buy their supply of guinea-pigs than to breed them.

For those who prefer to breed their own stock the following information is of value.

Guinea-pigs have from three to five litters per year with two to five to a litter.

Young females should not be bred until three months old.

The period of gestation is from 65 to 70 days.

The young are fully developed at birth and are usually able to run around within a few hours.

The young begin to eat green food within two to three days after birth.

The young may be weaned when two weeks old.

About five females and one male should be kept in each breeding cage.

For best results each female should not have over four litters per year.

Several females with their young should be removed from the males and placed in a cage together. The females nurse each other's young as the young apparently cannot distinguish between the nursing mothers.

Female Guinea-Pigs for Pituitary Assays should be segregated at time of weaning and kept out of sight and smell of males.

Diseases.—Practically all diseases of guinea-pigs can be traced to improper care or food. As before stated damp cages, drafts and decayed food will cause the death of many pigs.

Bowel Trouble.—Too much green food especially in winter produces bowel trouble. In unheated houses this condition is also caused by sudden changes of the weather or insufficient bedding. When suffering from this complaint the coat gets rough and stands on end. The animal appears humped and many times the disease kills within 24 hours.

Separate all sick animals, administer castor oil, supply thick bedding and disinfect cages.

Colds and Pneumonia.—These diseases are rare in properly heated and ventilated houses. In unheated and drafty houses, however, it is not uncommon to have the entire stock wiped out with epidemics of these diseases.

As these diseases are contagious all affected animals should be removed and the cages disinfected. The sick pigs should be placed in warm cages and treated with a few drops of spirit of ethyl nitrite twice a day.

Lice.—Treatment is the same as for dogs.

Other Diseases.—Guinea-pigs are also subject to such diseases as Paralysis, Worms and Tuberculosis. As only the common cheap variety of guinea-pigs are used for laboratory purposes it is usually cheaper to kill animals suffering with these diseases than to spend the time necessary in trying to cure them.

(To be continued)

ISOPROPYL ALCOHOL WARNING.

Concerning the use of isopropyl alcohol, the Anhalt Department of the Interior (Germany), draws attention to the fact that since isopropyl alcohol is employed in industry in place of ethyl alcohol in the manufacture of medicaments, liniments, cosmetics and perfumes, it is deemed necessary to issue a warning against the indiscriminate use of this substitute, and to draw attention to the possibility of injury to health which might be occasioned by the use of isopropyl alcohol in medicines in place of alcohol.

THE DETECTION AND COLORIMETRIC DETERMINATION OF TRACES OF ALUMINUM.*

BY I. M. KOLTHOFF.

In an investigation on the solubility of aluminum hydroxide, we wanted a very sensitive reaction for the detection and determination of traces of dissolved aluminum. The different methods described in literature were tested, however none of them could be used for our purpose. The well-known reaction of Atack[1] with alizarin—or its sulphonate is very sensitive (sensitivity about 0.2 mg. Al per liter); it appeared, however, that it gave very irregular results in making a colorimetric determination of aluminum. Therefore, different other substances were tried on their applicability as a reagent for aluminum, and we succeeded in finding an excellent reagent, namely, 1.2.5.8 oxyanthraquinone. This substance was recommended by Fr. Hahn, Wolff and Jager[2] as a reagent for magnesium. In alkaline solution the indicator has a violet color, in the presence of magnesium it is pure blue—(cornflower blue). By this method 1 mg. magnesium per liter, gives a distinct reaction and, if the color is compared with a blank, 0.5 mg. magnesium per liter may be detected. In studying the specific character of this reaction, we found that cobalt and nickel behave in the same way and react with the same sensitivity as magnesium.

Though the 1.2.5.8 oxyanthraquinone is a very sensitive reagent for magnesium, I prefer the titan yellow recently described by myself,[3] as the latter substance also may be used for the colorimetric estimation of this metal. With aluminum solutions the 1.2.5.8 oxyanthraquinone gives in weak acid solutions a nice purple color. The indicator itself behaves as an acid base indicator at; a p_H lower than 6 it has a yellow color, if a p_H higher than 7 it is violet.

Procedure for the Reaction of Aluminum.—Indicator solution: 0.1% in alcohol.

Buffer Solutions.—A mixture of 10 volumes, 5 N of acetic acid and 9 volumes of 5 N ammonia (after tenfold dilution $p_H = 5.5–5.7$).

To 10 cc. of the solution is added 0.25–1-cc. buffer mixture and 0.3-cc. indicator solution. After 15–30 minutes the color is judged: A solution with 1 mg. Al per liter gives an intense clear violet solution; 0.5 mg. Al per liter gives a nice clear violet solution; 0.2 Al per liter gives a distinct clear violet solution; 0.1 Al per liter gives a light clear violet solution.

If the color is compared with that of a blank (without Al), the sensitivity goes to 0.02 mg. Al per liter.

Colorimetric determination is performed in the same way as the qualitative reaction; the best scale for comparison lies between 0.5 and 0.02 mg. Al per liter; the colors must be compared after standing for the same length of time, *i. e.*, 15–30 minutes.

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* Scientific Section, A. PH. A., St. Louis meeting, 1927.

[1] Atack, *Journ. Soc. Chem. Ind.*, 34 (1915), 641; compare also *Chem. Zentralh.*, 11 (1915), 491; 1 (1916), 176; I. M. Kolthoff, *Pharm. Weekbl.*, 54 (1917), 1008; Keilholz, *Pharm. Weekbl.*, 58 (1921), 1482; *Chem. Weekbl.*, 20 (1923), 193; Baldwin, *J. Amer. Water Works Assoc.*, 12 (1924), 439.

[2] Fr. Hahn, Wolff and Jager, *Ber.*, 57 (1924), 1394.

[3] I. M. Kolthoff, *Chem. Weekbl.*, 27 (1927), No. 21.

Remarks.—1. The color of the aluminum lake develops gradually, after about 1 hour it has a maximum intensity. This maximum intensity is reached much sooner if the test-tubes are warmed after addition of the reagent at a temperature of 50° C.; the colorimetric determination may be made after five minutes standing.

2. The development of the color also depends on the p_H. The more acid the solution is, the longer it takes for the color to attain its maximum. If instead of a buffer mixture with a p_H of 5.6 another was used with a p_H of 4.8, it required about three hours before the solutions developed the maximum color intensity. Heating to a temperature of 90° C. accelerates the color development very much. At a p_H of 4.3 a solution with 0.5 mg. Al per liter gave after half an hour's standing no reaction. At a temperature of 90° C. a solution with 0.1 mg. Al, however, immediately gave a reaction, if the color is compared with that of a blank. As a matter of fact, the test-tubes used in these experiments must be of a high-grade quality, which do not respond to the test for aluminum.

3. The amount of buffer solution used is of little significance.

4. The clear solutions contain the violet aluminum lake in a colloidal state. If the color is judged after standing 10 hours, the lake is flocculate as nice violet purple flocs. Under the same conditions the blank gives a yellow-brown floc. In making a colorimetric determination it is necessary to compare, before the lake is flocculated.

5. Most metals are without influence on the reaction of aluminum. In salts of the alkali metals, alkaline earths, magnesium, zinc, manganese, nickel, cobalt, cadmium, lead and also of chromium. The presence of aluminum may be detected without difficulty. Copper has a somewhat disturbing action due to the dark blue color of a copper acetate solution; this may be corrected by the addition of an excess of sodium thiosulphate to the neutral salts, which reduces the cupric copper to the colorless cuprous copper.

Ferric iron has a disturbing action if it is present in quantities larger than 2 mg. per liter; likewise tin, antimony III and bismuth have a disturbing action, as they form precipitates, which also absorb some of the dye stuff. They can be corrected by the addition of an excess of Rochelle salt; or better, sodium tartrate. After addition of the buffer mixture and the oxyanthraquinone the solution is heated and remains clear. Due to the presence of the tartrate the sensitivity of the reaction on aluminum is somewhat decreased; in the presence of the metals mentioned 1 mg. Al per liter still may be detected. A blank should be run under the same conditions.

Summary.—1. 1.2.5.8 oxyanthraquinone is a very sensitive reagent for aluminum in weakly acid solutions.

2. Traces of aluminum can be determined in a colorimetric way with the reagent mentioned. The best concentrations for comparison are between 0.5 and 0.2 mg. Al per liter.

PHARMACY LABORATORY OF THE
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Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

All articles in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. E. Cor. Lombard and Greene Sts., Baltimore, Md.

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EXCHANGE ANALYTICAL WORK.

Chairman J. H. Foy, of the Committee on Business Policy of the American Pharmaceutical Manufacturers' Association, suggests the exchange of analytical work by groups, in order to verify reports. He holds that analytical control is now an absolute necessity because the safety of manufacturers depends upon the accuracy of this work.

CONCERNING THE SOLUBILITY AND DISINTEGRATION OF TABLETS.

BY R. A. KUEVER.

The method of administering medicines by means of tablets has become very general the past decade and the list of medicines so prescribed is rapidly increasing. One may now even have a choice in consuming some of the "famous" old "patent" medicines in the original liquid or in the tablet form. The popularity of tablets is due: (1) to the convenience to the patient, and (2) to the low cost of production to the manufacture.

The major objections which have been made against tablets are perhaps three in number: (1) variation in weight, (2) variation in content, (3) excessive hardness and insolubility. The first two may be overcome in the technic of manufacture by diligent care and attention, especially to the granulation before it passes into the die previous to compression. The third objection is one of real concern and has been the cause of bringing tablets somewhat under a cloud. If tablets are too hard and insoluble their rate of disintegration is too slow, or they may not disintegrate at all. Hence, the patient is deprived entirely of the medicinal effect. Some tablets have been found not to disintegrate in twenty-four hours when immersed in water, and tablets have also been known to pass entirely through the patient, being voided by the stool, and recovered perfectly intact. A doctor receiving such tablets on his prescription is sure to be disappointed, while the patient may justly feel that he has "paid too much for his whistle."

Unfortunately there are no well-defined standards for tablets in the U. S. P. or N. F. and there is a real need for such standards. The U. S. P. recognizes only one tablet—"Poison Tablets of Corrosive Mercuric Chloride." The standard for this particular tablet is established by its composition, but is not applicable to other tablets. The N. F. admits seven tablets, all of the compressed variety. The very general requirements are that these tablets shall disintegrate in a very few minutes when dropped into water, and that they shall not vary more than ten per cent in weight nor in medicinal content nor contain an excessive amount of lubricating material.

The solubility of a tablet and the rapidity with which it disintegrates depends upon the solubility of the ingredients and the degree of hardness with which it has been compressed. If the ingredients are insoluble or only sparingly so the tablet, of course, will be insoluble. If, in addition, a high pressure has been utilized in its compression, it is likely to pass through the system without imparting its therapeutic properties.

Inasmuch as all tablets pass through the stomach, and the very great majority are intended to disintegrate there, it is doubtful if the N. F. test for disintegration is entirely satisfactory. Tablets have been found that would not disintegrate in water at room temperature, while in 0.3 per cent hydrochloric acid solution at 37° C., they would disintegrate instantly. It is suggested, therefore, that the disintegrating test of tablets be made in a 0.3 hydrochloric acid solution, at body temperature.

Two general methods are in use as an aid in tablet disintegration. One method includes the addition of a carbonate or bicarbonate, as for example sodium bicar-

bonate, which, in the presence of the acidity of the gastric juice causes effervescence and hence disintegration. The second method incorporates from 10 to 20 per cent of dry starch to swell in the presence of moisture and cause disintegration. The objection to the first method is that a certain amount of effervescence frequently takes place before the tablets reach the consumer and with it a certain amount of disintegration. The objection to the second method is that starch will gradually take on moisture from the atmosphere, lose its hygroscopic properties, and hence its disintegrating power. Tablets containing starch must be kept in an air-tight container.

Many tablets require lubricants for compression, and lubricants have a marked influence upon solubility and rate of disintegration. Tablets have been found with enough hydrocarbons to render them impervious to water. Such a tablet cannot be expected to dissolve or disintegrate. It is believed that hydrocarbons have no place in tablets whatsoever.

A substance which lends itself perfectly as a tablet diluent is tricalcium citrate. It is a white, tasteless powder which is permanent, light and insoluble. It is compatible with most tablet ingredients. It granulates readily when granulation is required. It is available in coarse granular form which feeds into the die uniformly. When a lubricant is necessary 10 per cent of powdered cocoa may be added to the tricalcium citrate.

A tablet made with tricalcium citrate, as a diluent, may not disintegrate in water but it will disintegrate instantly in 0.3 per cent hydrochloric acid, at body temperature. Cocoa, as a lubricant, will not interfere with the disintegration. The hydrochloric acid of the gastric juice reacts with the tricalcium citrate, thus:

$$6HCl + Ca_3(C_6H_5O_7)_2 = 3CaCl_2 + 2H_3C_6H_5O_7$$

forming readily soluble compounds. A tablet so made is permanent under ordinary atmospheric conditions.

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THE APOTHECARY, A LITERARY STUDY.

BY EDWARD KREMERS.

28. UPAGUPTA, "SON OF A PERFUMER."

The modern rendering for *Ibn el-Attar* is "Son of the Apothecary"[1] though the original meaning of the Arabic *Attar*, our "Otto," *e. g.*, of roses, is that of a perfume. One of the mural paintings in the Casa Vettii.[2] which represents the perfumer expressing olive oil, rosating it, and selling his finished perfume to a society lady of Pompeii, is labeled "Farmacisti," at least on a modern Italian postal card.

[1] F. Wuestenfeld, Geschichte der Arabischen Aerzte und Naturforscher, p. XIII.

[2] See E. Kremers, History of the Apothecary Shop, V: The house of the Vettii. Am. Dr. & Ph. Rec. 68, 141.

When, therefore, in "Asoka:[1] the peerless monarch of India" we read of Upagupta, "son of a perfumer of Benares" we may not go far astray in assuming that we have a representative of one of the forerunners of the modern apothecary. The word *apotheca* was applied by the ancient Romans to their storage rooms. When used without modifying attribute, it designated the storage room for wine. The *apotheca librorum* was their storage room for books or library, the German *Bibliothek*, derived from the Greek *βιβλοσ*, book, and *αποθηκη* storage room. In the early development of European pharmacy during the renaissance, the word *Apotheke*, in German at least, was used to designate a storage room, more particularly the storage room for spices. We need but recall that the spices and aromatics were the true perfumes (from *perfumare*, to smoke through) of antiquity, being used in sacrificial offerings, originally as a means of covering the disagreeable odor of burnt animal offerings, later as a symbolic substitute therefore. The incense used in the Roman Catholic mass is a modern reminder of the ancient ritual referred to, and the *Candulae fumales* also the *Pulvis fumalis* of pharmaceutical formularies as well as the Chinese joss sticks and Sandal wood, clearly show us that even the modern drug store has not gotten away altogether from being a perfumer's shop in the sense of its ancient Hindoo prototype. *Szandalini* means dealers in sandal (szandal) wood and ben Szandalini is translated son of an apothecary.

In our study of the apothecary in literature and his prototypes of past periods of history we may well, therefore, include Upagupta, "son of a perfumer in Benares." Though himself not a perfumer, but a preacher, we may devote a moment's attention to him as we did to Hans Christian Andersen's "Two sons of a Danish apothecary,"[2] the one a great physicist and the other an important statesman. Unfortunately, we have no Indian Hans Christian Andersen to tell us about the father and mother of Upagupta and the influence they exerted upon this great reformer.

Chandragupta was the grandfather of Asoka. After the death of Alexander the Great in 321 B. C., he had defeated the Greeks and made himself undisputed master of the Behar, the ancient Indian Empire. The story told by Gladys Burrell Kirby and Frank M. Rich begins with the description of a tiger hunt by the grim old monarch on which he was accompanied by his grandson Asoka. As the gorgeous cavalcade passes a cemetery, the attention of the young prince is attracted to a group that pays no heed to the royal splendor but listens eagerly to a young man. The prince discards his royal robes and mixes incognito with the group and learns upon inquiry that the preaching young monk is Upagupta, the son of a perfumer of Benares. The speaker makes a deep and lasting impression upon the royal scion, but it is not until many years later that he acts in accordance with the impression the words make upon him. In a war, he has destroyed several hundred thousand men, women and children. As he triumphantly enters the conquered city, he is shocked at the sight of the ravages he has wrought and is reminded of the words of Upagupta. Upon his return home, he calls for Upagupta and has him tell what he knows about the sayings of Gotamo, the Sakya sage concerning the "Enlightened One."

Now he acts upon the teachings of Upagupta. It is said of him that he is "the only military monarch on record who ever abandoned warfare after victory."

[1] By Gladys Burrell Kirby and Frank M. Rich, The Open Court, 40, 577.

[2] Jour. A. Ph. A. (July 1918), 620.

"Through the dim distance of the ages, we glimpse the noble figure of one of the greatest kings of history—a strong man of high ideals, unflagging diligence and pious devotion. Reared himself in an atmosphere of colossal intrigue, cruelty, extravagance, voluptuousness and oppression, he became a paragon of honor, humanity, simplicity, purity and service."

"Former kings," he says of himself, "have brought divers blessings to mankind as well as I. My special thought has been to educate man to a devotion to principles of honor. What are these principles of honor? Reverence, useful labor, kindness of heart, liberality to others, loyalty to fact and personal integrity."

His last words were: "Through exertion comes the great reward, it cannot be obtained by position or influence. The humblest man, if he will exert himself somewhat, can win great future bliss."

Such were the results of the teachings of the monk Upagupta, the son of a perfumer of Benares, three centuries before the birth of Christ.

HOW PHYSICIANS CAN HELP THE INCREASING TREND OF PROFESSIONAL PHARMACY AWAY FROM COMMERCIALISM.*

BY FREDERICK J. WULLING.[1]

After I had given six of the series of twelve radio talks which I am broadcasting over Station WLB, the University station and known as the "Voice of the Campus," one letter among the many letters that my hearers sent me inquired whether pharmacy had an association comparable with the American Medical Association in so far as the latter represents the totality of interests of the medical profession, and if pharmacy had no comparable organization, in what manner it was organized. That suggested to me to draw a certain comparison between organized medicine and organized pharmacy, and I think it will be entirely consistent for me to tell you this evening something about the organizations of pharmacy for the purpose of laying a foundation for what I will say later about the improvement in purely professional pharmaceutical service that now can be found by those who look for it, contrary to the belief of so many that professional pharmacy has surrendered to commercialism.

Pharmaceutical activities are so much more numerous and diversified than medical practice is that so far pharmacy has not been able to unify itself in such a way that a single association could adequately represent all of its activities and aims and purposes. In the practice of medicine there is much more cohesion and less diversity and also a more pronouncedly professional spirit and a more general and unified adherence to professional ideals, while in pharmacy the professional practice is diluted and attenuated with other activities, especially commerce. In medicine the practitioners of the various medical and surgical fields all are engaged exclusively in giving a professional service. In pharmacy the service ideal is paramount and ranks first, but there is a secondary activity not found in medicine, namely, the engagement in commerce, which activity is motivated by the desire or in certain cases the necessity for greater material gain than it is thought can

* A paper read before the Hennepin County Medical Association, February 6, 1928.

[1] University of Minnesota.

be gotten from professional practice alone. Professional practice and trade activities are not compatible in the long run, probably because they are based upon different ideals: the professional upon the service motive and the commercial upon the gain motive. Both motives are of course entirely respectable and good, but followed concurrently by one person the one or the other of the motives must be relegated to second place. That is why some pharmacists who adhere to the ideals of professional practice do not succeed commercially and why many of those pharmacists who are commercially inclined are unsuccessful professionally. This explains also why there is in the ranks of retail pharmacy especially, a diversity of interests, which the past experience of older countries and already in a large measure of our own country has proven incompatible and futile as far as permanence of the dual activity is concerned. Pharmacy was at first entirely professional and when the commercial invasion began years ago, the professional and commercial ideals at once conflicted, and this conflict has increased with the acceleration of the commercial exploitation of professional pharmacy. Despite every possible endeavor on the part of the leaders in pharmacy to harmonize the two interests, there is a distinct disinclination on part of both the professional and commercial pharmacists to surrender one to the other. The situation is gradually solving itself by the withdrawal of many professionally-minded pharmacists who are establishing themselves for purely professional practice. When this withdrawal will have gone far enough, there will probably have become established a class of merchants who will deal in the merchandise now carried in so many drug stores but who will not be registered pharmacists under the jurisdiction and regulation of the state.

All this explains why the pharmacy of this country is not represented by a single association as medicine is represented by the American Medical Association. If pharmacy were practiced in a purely professional way, one association could represent it. That association would be the AMERICAN PHARMACEUTICAL ASSOCIATION and in that respect it would be comparable with the American Medical Association.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The association most like the American Medical Association and based upon identical ideals of service is the AMERICAN PHARMACEUTICAL ASSOCIATION, the oldest association of its kind and which celebrated its Diamond Jubilee at its seventy-fifth annual meeting at St. Louis last August. When the ASSOCIATION was organized, pharmacy was entirely professional in its practice. It was recognized then more than it is to-day that pharmacy as the chief specialty was an essentially medical practice differing only from purely medical practice by the fact that the pharmaceutical professional service involved the material items known as drugs and medicines and which naturally were the subjects of buying and selling. The pharmacist differed from the physician therefore in the respect that he gave a service and a commodity whereas the former gave only a service. The pharmacists had to engage in buying and selling, but this commerce was restricted to drugs and medicines. They bought the crude drugs and compounded them into medicines which the physician prescribed. The pharmacists in those days were well trained professionally because pharmaceutical study and practice occupied their

full time and interest. They controlled pharmaceutical education, but there was no control over the practice of pharmacy nor of the quality of crude drugs and pharmaceutical chemicals. It was for the purpose of remedying this situation and of improving pharmaceutical standards that the high-minded pharmacists more than one hundred years ago began to make efforts for a suitable national organization through which their influence and ideals might find expression. After many years of discussion and preparation, the AMERICAN PHARMACEUTICAL ASSOCIATION was finally organized in 1852. Then and for many years afterward it was comparable in its ideals to the American Medical Association. The ASSOCIATION has a most honorable history, and it records the names in its list of past-presidents and other important officers, of men famous not alone in their own country but in all countries. It would require several talks to acquaint you adequately and in detail with the successes and achievements of this grand old AMERICAN PHARMACEUTICAL ASSOCIATION.

When the AMERICAN PHARMACEUTICAL ASSOCIATION was first established all who were in any way definitely related to pharmacy were eligible to membership, but the earliest membership included practically only retail and wholesale pharmacists and only a very few pharmaceutical and chemical manufacturers because the manufacture of medicinal preparations had not yet been entered upon in any large scale. The purpose of the ASSOCIATION, however, was to represent all divisions of pharmacy and it did so most successfully. It did noteworthy work in the matter of pharmaceutical education and helped very materially in the later establishment of state and local associations through whom it exercised much affirmative influence in the shaping of state and national pharmaceutical legislation. It should be said here that all pharmaceutical legislation has alway been in the interest of the public and never primarily in the interests of the pharmacists.

The insinuation of trade into the practice of pharmacy began many years after the organization of the AMERICAN PHARMACEUTICAL ASSOCIATION. It was hardly perceptible when it first began but the exploitation by trade of the honored profession of pharmacy gradually increased until, through the acceleration of the past two decades especially, it has now grown to the point which has already caused the reaction I have described. At a certain point of the development of commerce in the drug store, many pharmacists began to feel that the AMERICAN PHARMACEUTICAL ASSOCIATION was not representing the commercial interests sufficiently, and since the Association showed no disposition to change its policy of representing primarily professional pharmacy, a group of pharmacists organized a new national association to represent the trade aspect of retail pharmacy. The new association was called the National Association of Retail Druggists.

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

It is quite true that the increase of trade activities in the drug store created many new problems. Indeed, I do not hesitate to repeat what I have often said: that practically all of the present vexing problems of pharmacy are growing out of the business development of the average store. The new Association did some splendid work in administering upon the new problems. It represented the commercial section of pharmacy and as such gave pharmacy a good service. It did not attempt to lessen the commercial activities nor chain stores, whose activities

are mostly commercial, and which have increased throughout the country in formidable numbers.

The AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists have therefore represented not identical interests, but interests that are in a measure opposed to one another. Yet they have both striven in the interests of pharmaceutical activities. They have worked harmoniously and concurrently in their respective fields but have resisted the occasional attempts to merge them into one association. They probably never will merge because their interests and purposes are not identical nor sufficiently related and sympathetic.

AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

It would take too long to explain the old apprenticeship system of instruction in pharmacy. Suffice it to say that something over a hundred years ago it was gradually abandoned and its place taken by the collective college instruction method and that colleges of pharmacy began springing up, the first in Philadelphia in 1821, the second in New York in 1829, and the third in Boston in 1835. Then a time arrived when the number of colleges had reached the point where conferences of their faculties became necessary because of the short courses and low standards of some of them, and accordingly in 1900 the representative colleges of pharmacy organized themselves into the American Conference of Pharmaceutical Faculties. The initiative toward this organization came from the AMERICAN PHARMACEUTICAL ASSOCIATION which had already established a Section on Education, through which it did the preliminary work necessary for the organization of the Conference.

The conference afforded a means for the exchange of ideas on pharmaceutical education and for ventilating opposing ideas and viewpoints, and in this manner gradually increased the pharmaceutical educational college requirement from none at all to high-school graduation. The Conference, of course, had no binding and compelling influence upon its member colleges, and when the proposal to increase the minimum college requirements to three years was presented for adoption, so many members objected and refused to comply that it was found necessary to change the Conference into an association which had a measure of controlling power over the colleges. Accordingly, two years ago the American Association of Colleges of Pharmacy became the successor of the American Conference of Pharmaceutical Faculties. The Association stands for high pharmaceutical educational standards and is requiring its members to give a minimum course of three years. Four or five colleges resigned at the time because they did not feel that they could meet the new requirements, but they have since announced their compliance, to begin very shortly. As a result of the stiffening of the educational requirements through the work and influence of the Association, some colleges have gone upon a minimum four-year degree basis. The University of Minnesota College of Pharmacy was the first to do this upon its own initiative. The Association is in close coöperation with the AMERICAN PHARMACEUTICAL ASSOCIATION and annually holds joint meetings with the Section on Education and Legislation of the latter ASSOCIATION.

NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

Concurrently with the development of pharmaceutical education improvement became necessary in the regulation of the practice of pharmacy, and the sev-

eral states created Boards of Pharmacy for that purpose. The principal function of the Boards is to regulate the practice of Pharmacy. Regulation includes the requirement of a minimum of education and training. At this point the boards and the colleges contacted. The requirements of many of the Boards were as low comparatively as the requirements of some of the colleges and the low-standard Boards and the high-standard colleges came into conflict. The colleges, however, had through the National Conference harmonized their standards somewhat and through their influence the several state boards gradually became converted to the need of more uniform requirements for registration, examination, and license, and so the Boards, at least the leading ones, organized themselves only recently into the National Association of State Boards of Pharmacy. It is the principal purpose of this new national association to harmonize and unify and raise in a concerted and collective manner the standards of the separate state boards. This Association has already accomplished wonderful results. It is coöperating splendidly with the colleges and with the AMERICAN PHARMACEUTICAL ASSOCIATION and with the National Association of Retail Druggists. These associations are coöperating in all interests that are common to them all and so are strengthening and invigorating one another. These four Associations have many matters in common and upon the administration of these there is already a unanimity and some achievement. All of these Associations, except the National Association of Retail Druggists, hold joint meetings at which they discuss and ventilate matters of mutual interest and concern and where, through contact and association, that good understanding and good-will which are necessary for mutual advancement are abundantly generated.

OTHER NATIONAL ORGANIZATIONS IN THE FIELDS OF PHARMACY.

There are a number of other national associations representing other divisions of pharmacy. The National Wholesale Druggists' Association represents the wholesale and jobbing aspects of pharmacy. This is an association of honorable endeavor and achievement and has exerted a very beneficial influence in wholesale pharmacy since 1882, in which year it was organized. It became the successor of the Western Wholesale Druggists' Association which was organized in 1876. The relation between the National Wholesale Druggists' Association and the AMERICAN PHARMACEUTICAL ASSOCIATION has always been especially amicable and mutually helpful.

There are two national associations, whose members are engaged in the manufacture of pharmaceutical products—the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association. These Associations, also, have been working forward in the interests of generally higher pharmaceutical standards.

The National Drug Trade Conference has been in existence for a number of years and has contributed its share to the development of pharmacy.

In close association with the American Association of Colleges of Pharmacy a number of seminars have been organized for the stimulation of research, but particularly for the exchange of ideas among the members of the several groups represented by the seminars. These groups are made up from all sections of the country and are therefore national in character. The first of these seminars was

the Plant-Science Seminar organized by Dr. E. L. Newcomb of the faculty of the College of Pharmacy, University of Minnesota. The first two conferences were held at the University of Minnesota and because of their signal success the organization of other seminars followed and there are now seminars covering the educational fields of Pharmaceutical Chemistry, Pharmaceutical Education, Plant Science and General Pharmacy. The fields of Pharmaceutical Botany, Materia Medica, Pharmacognosy, Drug Plant Culture, etc., are included in the Plant-Science Seminar.

There is also a national association covering the manufacture of proprietaries and especially the so-called patent medicines.

STATE PHARMACEUTICAL ASSOCIATIONS.

Out of the activities of the AMERICAN PHARMACEUTICAL ASSOCIATION there grew, as I have already stated, the various national associations just enumerated. The AMERICAN PHARMACEUTICAL ASSOCIATION was also and primarily instrumental in bringing about the organization of the earlier state associations. Now practically every state has its pharmaceutical association.

To enumerate the activities and achievements of the state associations would require much more time than is at my disposal, but suffice it to say that they all have had more or less of the pharmaceutical-professional spirit. Indeed, every one of them was originally based upon a purely professional and ethical conception of the practice of pharmacy. With the advent of commercialism in pharmacy, the state associations had to suffer the onslaught of ultra-commercialists, but practically all of them are still holding to their original ideas as much as is possible under the commercial stress of the time.

The Minnesota State Pharmaceutical Association was organized in 1884 by a group of high-minded and high-standard pharmacists for two purposes: first to obtain a state law to regulate the practice of pharmacy, and second, to have a college of pharmacy organized as one of the units of the State University. These two primary objects were soon accomplished and then the association directed its activities toward higher and higher standards. The forty-three annual volumes of Proceedings which it has so far published are a record of an achievement which is not exceeded elsewhere in quality, scope and worthwhileness. The Minnesota State Pharmaceutical Association is looked upon as one of the most forward and most professionally-minded of the state associations.

In Minnesota there is in addition to the State Association and local associations in Minneapolis, St. Paul, Duluth, the Iron Range, and in some counties, a new association called the Minnesota Pharmaceutical Educational Conference whose membership is made up by the entire State Board of Pharmacy, the executive faculty of the College of Pharmacy of the University of Minnesota, and the Education Committee of the Minnesota State Pharmaceutical Association. The Conference represents the three major pharmaceutical factors in the state and whose coöperation and forward work in respects and interests common to the three express themselves through the Conference. The Conference is doing some splendid work.

LOCAL PHARMACEUTICAL ASSOCIATIONS.

All of the large centers of population and some counties have their local associations. Some of these have been and are very influential. A number of them,

notably those of Philadelphia, New York, Boston, St. Louis, Brooklyn, Louisville and Cincinnati created colleges of pharmacy in their respective cities through which they did much affirmative work in the interests of better pharmaceutical training.

At present there is a tendency toward district associations in which the pharmacists of districts or sections usually larger than states meet for the discussion of matters of mutual concern.

A form of pharmaceutical organization of recent origin is the Veteran Druggists' Association, the first of which belongs to the city of Chicago. Because of the example and influence of the Chicago Association, more particularly through the work and endeavor of Mr. Wilhelm Bodemann, the inspirer of the Chicago Veterans, similar associations have been formed in many other cities.

These veteran pharmacists are men of maturity, experience, action and good common sense. While the chief aim is to create good fellowship and sociability and to uphold high practitional standards, some of them, our own Minneapolis Association anyway, cannot resist the demand for participation in or support of the most worthwhile pharmaceutical activities. These Associations are one of the most potent influences for better pharmacy that exist to-day.

I have given you all of this information to bring to your mind and to emphasize that there is a very substantial educational foundation and a very strong, extensive and efficient pharmaceutical structure upon which purely pharmaceutical professional service is based. This structure exists, although it may be hidden by the bright lights and the more or less commercial aspect and atmosphere of the average drug store. No one will deny that pharmacy gives a much needed service. That service is of course rendered in the average drug store in too large a measure as a service bringing less financial return than commerical service brings and therefore is with many merchant-pharmacists of secondary importance. The relegation of pharmaceutical practice to second place in many of the average drug stores has resulted in an increasing negligence of pharmaceutical practice and therefore to a distinct waning of professional efficiency which in turn very naturally has decreased the confidence of the public and of the physician in the ultra-commercial pharmacists and in their establishments. In the proportion in which emphasis is placed upon trade in the average drug store, the professional activity recedes more and more into the background. Indeed, there are many instances where the recession continued to a point of entire disappearance of any pharmaceutical practice, resulting in commercial establishments which were first referred to as "drugless drug stores." Commerce seems to be more remunerative than professional practice of any kind and so the number of so-called "drugless drug stores" increased by the incursions of the wholly commercially-minded persons who deliberately established drugless drug stores. There are therefore two kinds of drugless drug stores—those which evolved from professional establishments, and those which sprang into existence over night. These retail stores could not avoid the charge of exploiting the old honorable profession of pharmacy, and as a result they are now prohibited by law from using the word "drug" in any designation or reference to their business.

The diminution of professional practice in many drug stores has not yet reached the point where entire elimination is near at hand, and some of the more profession-

ally-minded pharmacists are trying to rehabilitate their professional practice and in other cases they are making strenuous efforts to maintain such professional practice as they still have. Pharmacists of this kind are entitled to the sympathy and support of the public and of physicians. They are the kind who are resisting as much as they can the onslaught of commerce and the competition of those other so-called pharmacists who care nothing whatever for professional practice, even belittling it and using every possible high-pressure system of doing business rather than practicing pharmacy. However, a very healthy indication of better things for pharmacy grows out of the fact that many professional pharmacists have resolutely and courageously withdrawn from the dual practice of the average drug store and have established themselves as purely professional pharmacists. Such practitioners are now found in every city and their number is increasing. They are getting the patronage of that part of the public which is discriminating enough to want so responsible a service, as pharmaceutical service is, rendered by practitioners who make of pharmacy a specialty instead of a secondary and neglected side issue. These new establishments are the ones who can render a professional service not only to the public but to the physician. They and the professionally-minded pharmacists who are earnestly engaged in rehabilitating or maintaining their professional practice are competent allies of the physician and many of then have initiated relations with physicians that are not only mutually helpful and advantageous but that also redound to the special benefit of the sick. Physicians and pharmacists should be allies. Some of them are; all of them can be if they will coöperate and exercise good-will toward one another. The medical profession is not holier than the pharmaceutical; it is accountable for some sins. It is, of course, not my purpose to designate in detail what these are, but I know you will pardon me if I say that altogether too many physicians prescribe proprietaries and fail to formulate their prescriptions and too many dispense medicines. There are among my personal acquaintances physicians whose materia medica is largely based upon the circular information of manufacturers rather than upon the National Formulary and the United States Pharmacopœia. Such could greatly help themselves by consulting with pharmacists. But, after all, when the worst has been said about pharmacy and medicine, it must be recognized that the stains upon these two great professions are quantitatively and qualitatively almost insignificant and certainly eradicable and remediable. Whole-hearted adherence to the highest pharmaceutical ideals and practice of pharmacy in its most ethical and professional aspects are the ideals fostered by associated pharmacy and especially by the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Association of Colleges of Pharmacy, and the National Association of State Boards of Pharmacy, who together express pharmaceutical ideals comparable with the ideals represented by the American Medical Association.

In conclusion let me say that physicians can greatly help the professionally-minded pharmacists and themselves by careful selection of the pharmacists who dispense their prescriptions. I certainly do not mean to say that there are registered pharmacists who are not qualified to prepare medicines and compound prescriptions, but I do not hesitate to maintain that physicians and the public have a reason and a right to discriminate. The measure in which physicians will increase their information and their knowledge of pharmacology, and especially of materia

medica and posology; and in the measure in which they will formulate their prescriptions, and in which formulation competent pharmacists can and are willing to be very helpful, physicians will not only help themselves and their patients, but they will help to restore much of the confidence which some of the purely professional pharmacists have lost in a respectable proportion of the medical profession. Physicians should not condemn pharmacy in the wholesale way in which some of them do, because pharmacy is much more highly developed and much more professional to-day than it ever has been, but it must be looked upon in the right light and not in the light and glare and ostentation of the modern ultra-commercial drug store. There are still some drug stores of to-day in which the physician can have full reliance and confidence. He may have to look a little more closely and discriminatingly.

RECIPROCITY EXPLAINED.

A Plain Statement of Essential Facts.

BY H. C. CHRISTENSEN.*

Reciprocity is a subject to which the pharmacist gives little thought until the day comes when necessity forces him to make his home in another state. Then he is either very happy and thankful to those who started such a thing; or, if he happens to be one of the unfortunate individuals who get the verdict "not eligible," he will be bitterly disappointed and probably will feel that reciprocity is a "myth."

This article explains just how reciprocity operates. Even those who may not contemplate changing to another state will benefit by reading it carefully. After such perusal, they will understand that the rules and regulations of the National Association of Boards of Pharmacy (and the states composing the membership) governing reciprocity are not discriminatory but fair to all. To the young student contemplating taking the board soon, the few minutes spent in reading this article may save much worry and disappointment in later years. To the pharmacist already registered will be made clear what he may expect in the way of reciprocal recognition on the state license or certificate he now holds.

IN THE EARLY DAYS.

Prior to 1904 there was no established reciprocity between states. A pharmacist practicing in the East or Middle West who found it necessary to go to Colorado or Arizona or any other state for a change of climate or to seek new business opportunities had to take a big chance. First, a long and expensive trip; then perhaps a wait of two or three months for the state board examination; finally either registration or, more often, failure. It is usually difficult for a pharmacist who has been in the retail drug business ten or fifteen years to pass an examination. He has forgotten much of the technical "book" knowledge on which the written examination is based, but this does not mean that he is not a worthy and competent pharmacist. He is usually a far safer guardian of the public health than the inexperienced youth who is just starting out with a new license.

* Secretary of the National Association of Boards of Pharmacy.

HOW RECIPROCITY STARTED.

A group of board members attending the conventions of the AMERICAN PHARMACEUTICAL ASSOCIATION talked over this situation, called a meeting, and in 1904 organized the National Association of Boards of Pharmacy—voluntary banding together of the boards of pharmacy with the following purpose, as stated in its constitution: "*To provide for inter-state reciprocity in pharmaceutic licensure, based upon a uniform minimum standard of pharmaceutic education and uniform legislation.*"

The National Association of Boards of Pharmacy would be glad to establish a system of reciprocity which would make every pharmacist of every state eligible for reciprocal registration in any state he might choose, if that were possible. However, the only thing that can be done is to make the best of conditions and circumstances by establishing a reciprocity as inclusive as possible under existing laws. This has been done.

The greatest difficulty to overcome is the wide difference in the standard of requirements in the various states. Every American knows that one of the fundamental principles of our United States Government is the doctrine of state rights—the sovereign power of the individual state to govern within its own borders. And states, like people, have a flair for individuality. If Mary gets a new dress, it must *not* be just like Susan's. So if Ohio passes a new law, it must be a little different from that of Indiana on the same subject. This lack of uniformity is the greatest stumbling block to reciprocity. In commencing its work, the National Association of Boards of Pharmacy was confronted by forty-eight state pharmacy laws and that of the District of Columbia, with no two of them alike. The problem was to find a common denominator.

OTHER PROFESSIONS HAVE SAME PROBLEM.

Pharmacy is not the only profession which is subject to the inconvenience of this lack of uniformity in state laws. Every profession—medicine, dentistry, law, etc.—is confronted by a similar question. Pharmacy, however, has developed a more inclusive reciprocity than any other profession, and the only chance for further extension is by an equalization of state requirements.

The proponents of a "national pharmacy law" have indeed a worthy ideal, but it will undoubtedly go the way of all impractical dreams. A law which takes away from the state the right to govern over matters within its boundaries is unconstitutional. Witness the Federal Child Labor Act passed by Congress September 1, 1916. It was declared unconstitutional by the Supreme Court a few months after it became effective on the grounds that it took away from the states a power granted them in the tenth amendment of the United States Constitution—which amendment sets forth the doctrine of state rights. When such an important measure as the regulation of *child labor* cannot secure national legislation, what possible chance has one profession?

HOW RECIPROCITY OPERATES.

Now for a more detailed account of how the present system of reciprocity operates. Each state board of pharmacy is required to enforce the pharmacy law of the particular state in which it functions, and can give allegiance and support

to the National Association of Boards of Pharmacy only in such a manner as not to conflict with that law.

If the requirements for entrance to examination in all states were equal, it would be an easy matter to establish an unlimited reciprocity, as a board has the right under existing state laws to grant reciprocity by recognizing the examination of a sister state, provided that the applicant himself was eligible for the recipient board's examination. But, how is it possible for Pennsylvania to recognize all of Colorado's registrants, which latter state in spite of many strenuous efforts has been unable to secure a state law with a higher requirement than grammar-school graduation, whereas, Pennsylvania has required college graduation since 1906? Obviously, the Pennsylvania Board of Pharmacy has not the right to grant reciprocal registration to a Colorado pharmacist who took examination on credentials consisting of grammar-school graduation and four years of apprenticeship, when it would deny Pennsylvanians the right to even sit in an examination under such circumstances.

Let us take a less extreme case—that of two states each having a college prerequisite—New Jersey and Pennsylvania. Is it not possible for these states to have unlimited interchange, since both now have the same standard? The answer is "no," for while Pennsylvania has required college graduation since 1906, New Jersey has only required it since 1920, hence there are many non-graduate pharmacists who registered in New Jersey between 1906 and 1920 who would not be able now to qualify for reciprocal registration in Pennsylvania. Thus the matter of the dates on which requirements became effective further complicates reciprocity.

There is also the question of evasion. If a *non-graduate pharmacist residing in a graduate state could go to a state without the college requirement and take examination, and later secure reciprocal registration in his home state, reciprocity would nullify the higher qualifications required by the graduate state.* Reciprocity was never intended for such purposes. If this type of evasion were permitted, it would be another infringement on the sovereign right of the state to set its own standard and would eventually lead to the abolishment of reciprocity.

BASIC RULE FOR RECIPROCITY.

The "common denominator" finally adopted, which covers all of these points fairly, and which is usually called the basic rule for reciprocity, reads as follows:

The applicant must have had the legal qualifications at the time of examination and registration in the state from which he applies which would AT THAT TIME have enabled him to qualify for examination and registration in the state to which he is applying for reciprocal registration.

Thus graduate pharmacists who are registered in Colorado, Arizona, Massachusetts, and other states not having a college prerequisite are not punished because of their state's lack of this requirement, but are eligible for reciprocal registration in any state in which they could have qualified for examination and registration on the date of their original license. This is because the applicant's personal qualifications are made the basis for reciprocity, not the state requirement. Various other technicalities must be considered, but it would be tiresome to elaborate upon them here.

Please notice that it is the applicant's qualifications at the time of examination and registration which are the basis for judging his eligibility for reciprocal registration in any particular state and not his present qualifications. The question which must always be asked is, "Was this man eligible to take examination in the state with which he desires to register by reciprocity on the day when he became registered in the state in which he holds license by examination?" If the answer is "yes," he should be able to qualify for registration by reciprocity.

For example, supposing John Smith registered in Missouri by examination in 1920, filing as credentials four years of apprenticeship. In 1928, he decides that he wants to make his home in Mississippi, but Mississippi has had a college-graduation requirement effective since 1921. Is he eligible? The answer is "yes," because his registration in Missouri in 1920 makes him responsible only for requirements in force in Mississippi at that time and exempts him from the college-graduation requirement of that state which did not become in force until 1921. By this system of reciprocity, a registrant is exempted from any higher requirements enacted by other states after the date of his registration by examination. Also, inasmuch as higher standards are adopted from time to time by the various states, it follows that any system based entirely on present-day requirements is not practical or fair to the registrants of an earlier period.

KEEP IN GOOD STANDING.

Just a word of caution to pharmacists now registered. Always be sure to keep in good standing by payment of renewal fees in the state in which you originally registered by examination, if required. Reciprocity is always on the basis of registration by examination. Registration obtained by reciprocity cannot be used to secure further reciprocity. A person who registers by examination in Illinois and then secures reciprocal registration in Indiana, dropping his Illinois registration, finds himself in a bad way later when he may wish to go to Ohio or some other state. Illinois will not certify to his registration and grades *unless he is in good standing*, and Indiana has *no grades* as he did not take an examination there. He might take an examination for reinstatement in Illinois, but if his reinstatement were dated on the later date, it would cancel his exemption from higher requirements enacted in the interim.

IF YOU CONTEMPLATE TAKING THE BOARD EXAMINATION.

To the young man who contemplates taking a board examination soon, the following is good advice to heed:

Thirty-four states now require college of pharmacy graduation. The present minimum recognized course is three years. If you register without being a college graduate, you bar yourself from reciprocity with the present college prerequisite states, and these usually offer the best opportunities and the highest salaries.

With only two or three exceptions, the states require retail drug-store experience in addition to college, even for four-year graduates. The minimum for three- and four-year graduates is one year of retail drug-store experience. Many states require as high as two years' experience for the three-year and even the four-year graduate. The recognized two-year graduate (who entered college before the September 1925 term) is required to furnish two years of drug-store experience

in some states; in others, where credit for college counts for actual months of attendance only, the experience required is two and one-half years. It is therefore important that every candidate for registration by examination make sure of enough prior experience before taking the board. Experience obtained *after* registration has no value as prior experience. It is wiser for the college graduate to delay completing his registration until he has had sufficient experience to meet the maximum state experience requirement, thus insuring himself against disappointment in the future should he find it necessary to register in such a state by reciprocity.

There are still two or three states that admit candidates to examination on only three years of apprenticeship. To register with such qualifications is folly, as the registrant bars himself from reciprocity even with the non-graduate states requiring four years of apprenticeship, and cuts his field of future activity to a very limited range.

After registering by examination in a state, you should be sure to remain and practice pharmacy in that state for at least one full year after obtaining your state license or certificate, as the general rules for reciprocity require that a pharmacist practice in the State of examination at least a full year *after* registration before he is eligible for reciprocity in another state. Under extenuating circumstances, some states have the power to waive this requirement but that is the exception rather than the rule.

The National Association of Boards of Pharmacy now numbers forty-eight member boards—forty-six states, the District of Columbia and the territory of Alaska. California and New York are the only two states not actively affiliated. New York has been an associate member for years and has assisted in the work of the Association but for technical reasons within the state has been unable to become an active reciprocating member.

HOW TO REGISTER BY RECIPROCITY.

What must the pharmacist do when he wishes to register by reciprocity? The first step is to write to the secretary of the National Association of Boards of Pharmacy[1] for a preliminary information blank. This form can also be obtained from the secretary of any member board of pharmacy.

Great care should be taken in filling in this blank and *all* experience both prior to and since registration should be listed, giving at least approximate dates, name of employer and location. All the questions asked in the blank should be answered fully. A lack of proper information may lead to a wrong decision. Many careless individuals do not take the time to write in all of their experience and are quite surprised when turned down because of "insufficient experience," and say, "But I had more." The burden of proof is on the applicant; only the submitted credentials are considered and investigated. The fee for the official application blank is $15.00 and a money order or bank cashier's check for that amount should be attached when sending the preliminary information to the secretary of the National Association of Boards of Pharmacy.

The N. A. B. P. secretary's office carefully checks the information submitted to determine the question, "Would this registrant have been eligible to take

[1] H. C. Christensen, 130 N. Wells St., Chicago, Ill.

examination in the state with which he desires to register by reciprocity, on the day when he took examination in the state in which he now holds license?" If the answer is favorable, the official reciprocal application blank is issued with full instructions as to how it is to be executed and filed with the recipient board of pharmacy.

The only object in withholding official blanks from those who are not deemed eligible is to save them the cost of personal appearance before a board in a distant state and the loss of considerable time and money. If there is any hope of acceptance, the official application is issued so that it may be submitted to the board for consideration. All credentials are carefully checked and subject to verification. Therefore, in submitting information, honesty is the best policy.

Issuance of the official application for reciprocal registration is no guarantee of acceptance by the recipient board. The N. A. B. P. secretary's office has no record of grades and these have an important bearing on acceptance or rejection. Then, too, the recipient board is the last court and has discretionary power to reject applicants for a cause.

In case of rejection, a refund of $10.00 of the $15.00 fee for the official blank is made to the applicant, although the actual cost of handling the case may be considerably more than $5.00.

There is a time limit of 90 days for filing the official blank. This limit was found necessary as holders often abused the privileges conveyed by delaying registration for long periods. When the circumstances warrant it, the application may be renewed for another 90 days, provided request for renewal is made before the first 90-day period has expired. An additional fee of $5.00 is charged for the renewal. Many states issue temporary permits to practice while reciprocity application is pending. Some do not.

In addition to the fee for the official application, there is a state registration or license fee. This varies from $10.00 to $30.00, according to state. Only one state charges $50.00. There is also a fee for certification of registration and grades, usually $1.00, payable to the certifying board.

Here is another important matter: If an applicant takes the regular examination in a state and fails, he is usually debarred from entering that state by the reciprocity route. For example, if a candidate *fails* in an Illinois examination, then later passes the Indiana examination, Illinois will not receive him as a registrant by reciprocity.

WRITE THE N. A. B. P. FOR INFORMATION.

The secretary's office of the N. A. B. P. is an information bureau. Every day many letters are answered regarding reciprocity and the requirements of the various states. In this office has been gathered information from many sources. An attempt is constantly made to keep the pharmacy law files up to the minute. Here the pharmacist may write for an opinion as to his standing in any particular state—the information is available for the asking.

The National Association of Boards of Pharmacy has not contented itself with the mere carrying out of reciprocity as it is now established between its member states. The organization has always had a second purpose—the establishment of a uniform standard of pharmaceutic education and uniform legislation—

and has constantly striven toward this goal, realizing that there can be no all-inclusive reciprocity until the standards and requirements of the individual states have been brought to an equal basis. Once that object has been accomplished, a true reciprocity of national scope will have been made possible.

THE PHARMACIST AND THE LAW

BY HOWARD KIRK,* EDITOR OF THIS DEPARTMENT.

"Poor Lawyers Are Hurting Pharmacy" states an esteemed contemporary. Sad, but true, we reply—poor lawyers hurt about everything they touch. But we must stage our little comeback. Poor pharmacists are hurting lawyers, say we, and hurting preachers, and newspaper reporters and everything they can lay *their* hands on. Suppose we call it quits on that score.

Our contemporary seems to have a queer idea of the lawyer. The article pictures a furtive, four-flushing figure in a morning coat, pushing open a silent back-drop door—emblem of slyness—and that figure is supposed to represent a lawyer. Underneath is the legend:

> "A lawyer may be shrewd in his own way. He may be foxy and full of schemes. But if he doesn't know pharmacy—if he's an amateur at the art of getting bills passed—pharmacy is better off without him."

Apparently, then, the ideal pharmacy lawyer must be "shrewd, foxy and full of schemes"—and must also understand the art of getting bills passed. To the last item we agree. It is a grand art to know how to meet a Legislative committee. It is an art that every lawyer may covet. To learn it, he will need to be sure of himself and sure of his proposition, and know how to state it in words of one syllable.

But if he desires to meet the great American populace in Congress assembled, or in Legislative Committee gathered and seated, let him forget what it is to be "shrewd, foxy and full of schemes." Some clear-eyed men are at our state capitals—men that have fought their way up in political life through every obstacle of trickery and ambush, and it will be pretty hard for him to fool those men. There are a hundred chances to one that they will fool him, if he relies on his schemes and shrewdness. Come out with your proposition, brother, and lay your cards on the table. Questionable means will not bring about legislation that is essential for the protection and conservation of public health; for example, that for regulating the practice of pharmacy. You must appeal directly to the sound sense that is in every man, whether he be on or off a legislative committee. Say what you have to say, and when you are done, stop. Then if you are on the job, and continue to stay on the job, you may get your legislation passed.

And you may not. There is no sureness about it, and no mystery. But we would like to re-draw the slick gentleman in the morning coat. Just a little professional pride, perhaps, but real lawyers don't look that way.

How do they look? You couldn't pick 'em out from any other crowd of good-lookers. They just look as if they could take you on for a fight or a frolic—whatever is necessary.

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Turning to another contemporary, we find that in Norway a law has just been passed threatening with three months' imprisonment all doctors who do not write their prescriptions in a plain and legible hand, and sign their names with equal clarity. Here is a stride forward! No longer shall druggists in Norway have to puzzle over doctors' pot-hooks. The physician there must be able to sing—

> "I treated all my patients with a smile so bland,
> And copied all prescriptions with a fair round hand"

if he hopes to keep out of gaol.

Still, do we in this country need the change? Somehow or other, druggists here do manage to fill doctors' prescriptions, and the mere fact that the patient can make nothing out of their hieroglyphics adds a rather pleasant air of magic to the proceeding. As one English newspaper puts it—

> "The faith of the patient in the efficacy of his medicine counts for much of his cure, and if prescriptions were made out in plain English instead of abbreviated dog-Latin, and were neatly typewritten instead of being hastily scrawled, faith might be sensibly diminished."

Magic still counts for something in medicine, so we might as well hold on to it.

* * * * *

A druggist friend of ours the other day told us that a prescription drawn up by a local physician was presented to him by a child who said that it was for the baby at home. Something in the prescription was wrong—too strong for a baby—and our friend refused to fill it. He called up the physician on the telephone and an angry word-fight resulted. Our friend wanted to know what his rights were and also the extent of his responsibility. An old law-book "Hilliard on Tarts" treats of the subject:

> "It sometimes occurs that a druggist is called upon to fill a physician's prescription, which he has reason to believe will be dangerous, or even deadly to the patient, if used in the manner directed. If the physician cannot be reached, or if he insists that the prescription is correct, the only way to avoid responsibility is to refuse to fill the prescription. If compounded as written, and injury resulted as a consequence, the compounder would be liable as well as the physician."

The point came up for decision in a Louisiana case some years ago where it was held that a druggist might refuse to fill a physician's prescription without being liable in damages to him. The Court said:

> "In many cases the druggist may have the best of reasons for declining to fill a prescription. As a chemist he may perceive or have cause to suspect that the physician erred in his prescription, or the druggist may not have at hand the ingredients, or he may distrust his ability to prepare the prescription, or other causes may disincline the druggist to undertake filling the prescription presented to him. Recognizing the room for all such cases, we cannot hold that the mere refusal of a druggist to fill a prescription furnishes any occasion to hold him for damages to the physician."

But, let us add, let the druggist beware of making impolite remarks about the physician when returning the prescription to the patient. In the Louisiana case the druggist said the prescription "was not worth a straw." This remark cost him $100.00, for the judges said it was a slander on the physician and awarded damages against the druggist for that amount.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted By Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

THE PSYCHOLOGY OF EFFECTIVE DISPLAY.

(*Continued from March* JOURNAL.)

The most effective and inexpensive means of advertising for many retail stores are display windows, and the space inside the store. The same principles which are effective in attracting and holding attention for window displays can be applied successfully to interior displays.

As contrasted with the interior display, the window display has the added task of drawing people into the store after it has attracted and held their attention. On the other hand, however, the window display is seen by many more people than the displays inside the store. It often happens in many locations that ten or a hundred times as many people pass a store as enter it.

In the physical construction of displays themselves, whether they are inside the store or in the window, there are some general psychological principles which always should be taken into account.

Don't be frightened by the word psychology. Psychology, in every-day terms, is simply a study of the way people act and the mental and physical causes which initiate these actions. As one popular author has said, psychology is a study of why we behave like human beings!

What I have tried to do in the preceding articles in this series is to enumerate generally known psychological principles and explain how their use can cause a display to attract and hold maximum attention. That is to say, the more we know about the causes which will make people stop and look at a display the more productive and profitable that display which properly employs these psychological principles can be made to be. The more attention a display attracts and holds, the more opportunities it has, quite naturally, to make sales.

Similarly, in the physical construction of window and store displays, the effective use of psychological principles can make these displays have the greatest possible selling power.

The first of these principles is balance. A display should not be top-heavy, nor should it be lopsided. Why? We unconsciously appreciate that which is balanced. It is restful and harmonious. Unbalanced displays create impressions which are disturbing and inharmonious and therefore unpleasant.

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* Instructor of Merchandising, Wharton School of Finance and Commerce, University of Pennsylvania, Lecturer on Business Administration, Philadelphia College of Pharmacy and Science.

Lateral (horizontal) balance is achieved by the arrangement of the objects in the display in such a manner that the physical bulk of the objects on either side of the middle of the display appears to the eye to be equal. This does not mean necessarily that the objects in the display have to be all of equal bulk or height. On the contrary, such a display is likely to appear so monotonous and uninteresting that it will attract and hold little attention. Horizontal balance very well may be in the form of an upward or a downward swinging arc, with the lowest or highest point in the middle of the display.

In the case of an upward swinging arc this effect is obtained, of course, by having the smallest objects in the display at its outer edges and with other objects gradually increasing in size until the largest ones are in the middle.

In the downward arc, the largest objects are at the outer edges, gradually decreasing in size until the smallest are in the middle.

But what if all the objects to be displayed are of the same size? Anyone is familiar with the pyramids of canned goods which are to be seen in almost any well-managed grocery store. Although all the cans are of exactly the same size, the upward arc effect is obtained by piling the cans on top of each other in pyramid form.

It is necessary to be careful, in the construction of such displays inside of a store that they are not so intricate as to block or hinder sales. Time and again people have refused to help themselves to merchandise arranged in an intricate but balanced design, for fear of destroying its symmetry. Then, too, some customers are afraid to touch such displays for fear their removal of a package or two will cause the whole display to come tumbling down, with embarrassment to themselves and annoyance to the store's salespeople.

Displays are only a means to an end and that end is sales. Therefore, they should be so constructed that merchandise as it is sold can be removed readily and the symmetry and balance of the display restored easily. (Needless to say, this is more important in store displays than it is in window displays.)

Vertical balance means simply that the display should not be top-heavy. Its base should be wider than its peak. Generally speaking, a display should not be more than two-thirds or three-quarters as high as its greatest width.

Articles displayed more than six feet above the level of the store floor or sidewalk are not seen by most people. The reason is that it is uncomfortable to look upward. Objects at or below the eye level can be seen and studied without much physical effort. In other words, a display more than six feet high, no matter how attractive it may be, is under a distinct handicap because of the special effort required to see it.

That is one of the handicaps of sky writing as an advertising medium. An unnatural and rather painful physical effort is required to see it.

The lower limit of effective display space is about ten inches or one foot above the store floor or sidewalk level. Everyone doesn't have perfect eye sight and, even for those who do, it is a distinct effort to see and be impressed by merchandise too far below the eye level. This is especially true in drug stores because a large part of the merchandise displayed is small in size. In jewelry stores, which have the same problem to even a greater degree, the issue is met by raising the level of window and show-case displays to a height of thirty to thirty-six inches above the floor.

Just as the effective display space in a store or in a window is limited to a maximum height of about six feet above the floor or sidewalk and a lower limit of ten inches to a foot above the floor or sidewalk, so is the depth that a display can have limited. Naturally, this depth varies with the size of the articles which are displayed. Merchandise which is small in size can be displayed effectively only in arrangements of shallow depth.

In windows or other display spaces which are deep, the smallest articles should be placed nearest the front and those of larger size arranged behind them in ascending order of size. Thus each article gets display space which is effective for it. It is easy to see how the selling possibilities of a display would be destroyed if the larger articles were placed in front of the smaller ones.

Every display should have incorporated in it some eye arresting attention-getter. It may be a bright spot of color, a price tag, a sign, or some one object which stands out from the rest of the display. This is what is called the focal point of the display. It serves the same purpose as headlines or pictures in a newspaper. The eye is caught by this focal point and interested; then the study of the remainder of the display begins. The creation of a focal point in a display is the second psychological principle which should be made use of in the physical construction of a display. Without it the display is as dull and lifeless as a page of fine print.

Once the focal point or high spot has caught the eye, the hope is that the display will prove so interesting that at least a part of those so attracted will look at it until they have seen the whole display.

Here, too, it is well to take advantage of a third well-known psychological principle. In reading the eye moves from left to right and from the top to the bottom of the page. Any other movement is unnatural and therefore difficult. A display which is so arranged that its various elements may be seen in a left to right, top to bottom order takes advantage of this principle and thus helps itself to gain and hold interested attention.

The psychological principles which can be used to make window displays more productive and profitable now may be summarized as follows:

1. Attention getting principles.
   a. Mechanical.
   b. Inherent in the merchandise displayed.
2. Attention holding principles.
   a. Mechanical.
   b. Inherent in the merchandise displayed.
3. Psychological principles in the physical construction of displays.

The third of these three general groups is discussed in this article. The preceding two I undertook to explain in preceding articles of this series.

NEW MEXICO STATE BOARD OF PHARMACY MEETING.

The next regular meeting of the New Mexico State Board of Pharmacy will be held in the Franciscan Hotel at Albuquerque, N. M., May 21, 1928.

Examinations of candidates for registration and other regular business will be carried on.

All requests for information should be sent to the Secretary, David L. C. Hover, Cloudcroft, New Mexico.

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

A. C. Taylor, President, Washington, D. C. J. W. Gayle, Treasurer, Frankfort, Ky. Lucius L. Walton, Chairman of Executive Committee, Williamsport, Pa. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Indiana	Montana	Rhode Island
Alaska	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming

DISTRICT MEETINGS.

The usual spring activity in district meetings is well under way. District No. 4 had the honor of holding the first meeting on February 29th at Des Moines, Iowa. To District No. 2 goes the honor of holding the meeting with the largest attendance so far—52 representatives of colleges and boards—at Baltimore, Md., on March 5th and 6th. District No. 6 also held a very successful and interesting meeting on March 20th and 21st at Hot Springs, Ark.

Before this issue reaches our readers, two more district meetings will have been held—that of District No. 7 at Birmingham, Ala., on April 10th and 11th, and that of District No. 5 at Bristol, Va.-Tenn., on April 13th and 14th. Both districts are vying to break all previous records.

All of these meetings are joint conferences of board and college faculty members. Although only inaugurated last year, these joint meetings have aroused great interest. A frank and free discussion of common problems in this manner, the writer believes, will accomplish far-reaching results within the next few years.

It is impossible to give very much of a synopsis of these meetings in the small space allotted to this department, but the N. A. B. P. secretary's office will mimeograph the complete proceedings of each of these meetings. Copies will be mailed to those in the respective districts, and an additional supply will be made available for any who ask for them.

Resolutions and recommendations adopted by the district groups will be presented for discussion and action at the national conventions of the N. A. B. P. or the A. A. C. P., or both.

A few of the more important recommendations are given below:

WHEREAS, it has come to the attention of the members of the state boards of pharmacy and the representatives of the colleges of pharmacy assembled in conference that a bill has been introduced in the respective houses of Congress which will give commissions to pharmacists in

the U. S. Public Health Service who are performing duties comparable to those of other professional and scientific officers and whereas this group of educators and board members believes that this recognition of the importance of the duties of the pharmacist is both proper and desirable therefore

BE IT RESOLVED, that the representatives present at this conference endorse and urge the passage of this legislation House Bill No. H. R. 11026 and Senate Bill No. S. 3356, and

BE IT FURTHER RESOLVED, that it is the hope of this group that in the appointment of the National Advisory Health Council provided for in this legislation, there be included at least one pharmacist, and

BE IT FURTHER RESOLVED that this resolution be brought to the attention of the House and the Senate.

RESOLVED, that it is the sense of this conference that board-examination questions be so prepared as to avoid ambiguity and that boards refrain from asking questions which cannot be clearly and definitely interpreted by the person taking the examination.

RESOLVED, that in presenting questions based on National Formulary and unofficial preparations, the boards confine same to the more commonly used preparations and compounds.

RESOLVED, that examiners bear in mind the progress that is being made in the sciences and that examiners endeavor to keep in mind the trend of the times in medical and pharmaceutical procedures when preparing examination questions.

RESOLVED, that three-day-a-week schools of pharmacy are considered inadequate for recognition.

RESOLVED, that the term "official" when used in board examinations be interpreted as meaning a preparation or drug listed in the U. S. P. or N. F.

RESOLVED, that the proposition of members of college faculties serving on boards of pharmacy be disapproved.

RESOLVED, that examiners keep in mind the various phases of a subject when asking questions and avoid as far as possible making their examinations one-sided.

RESOLVED, that the repetition of examination questions be avoided as far as possible in succeeding sets of examinations.

RESOLVED, that elementary questions in the fundamental sciences of Chemistry, Botany and Physiology be omitted from examination in college prerequisite states.

RESOLVED, that in the framing of examination questions, the examiner distinguish clearly between the ingredients used in manufacturing a product and the constituents of the finished product.

RESOLVED, that the use of such general terms as "outline," "discuss," etc., be discouraged and that specific terms such as "describe" or "describe in detail" or "describe briefly" be used in their place.

RESOLVED, that questions on bacteriology and drug assaying be included in board examination but that they shall be of such a nature as to test candidate's ability to use this knowledge in his pharmaceutical practice.

RESOLVED, that questions on materia medica shall not be limited to vegetable drugs but be broadened to include synthetic chemicals, biological products and animal products, and resolved that questions on chemistry be properly proportioned between organic and inorganic chemistry.

RESOLVED, that at the next and future joint meetings the final examination questions of the colleges of pharmacy be presented for criticism, as well as the questions asked by boards of pharmacy.

RESOLVED, that 40% of the questions in the chemistry examination shall be on organic chemistry but that such questions shall be of a practical nature rather than complicated formulas, etc.

RESOLVED, that the question paper on pharmaceutical and chemical problems be confined to pharmaceutical and chemical problems which require arithmetical calculations.

RESOLVED, that the minimum passing mark required in practical pharmacy be raised to 75%.

RESOLVED, that these joint conferences be continued and held annually.

RESOLVED, that careful consideration be given to the recommendations in the Charters report with reference to the addition of subjects to be added to the pharmacy curriculum.

WHAT AN EGYPTIAN THINKS OF AMERICAN PHARMACY.

H. A. Naser who made a trip from Egypt to take the Iowa board examination called at the N. A. B. P. secretary's office recently and was asked his opinion of pharmacy in America and particularly the American drug store.

As a graduate of the University of Iowa School of Pharmacy in 1925, he returned to his own country to teach pharmacy in the University of Cairo, but found that no recognition would be given him for his American college education unless he could also show a license from a state board of pharmacy as evidence of his ability. He returned to America just too late for the November meeting of the Iowa Board and was obliged to wait over for the March examination. The cost of the entire trip will be about $1700, which, as Secretary Eaton says, "is proof that he has his profession at heart."

Secretary Christensen suggested that inasmuch as the trip back to Egypt is an expensive one, Mr. Naser might stay and practice pharmacy in America.

The latter reluctantly admitted that he did not like the idea. When asked why, he replied hesitatingly lest he should offend, "But I have much pride. In my country the pharmacist is like the physician. He has honor. Here in America—he is, well, like a waiter. Always it is the ice cream and cigarettes."

That remark alone should set American pharmacists to thinking about where the tendency to commercialize is leading.

Mr. Naser based his opinion on his own experience working in American pharmacies. He entered the profession with high hopes but soon learned that his professional training was given little opportunity to function. It was an interminable process of serving ice cream, cigarettes and lunches and wrapping packages—duties which a man without any scientific education could perform. True, he was called upon to fill a prescription once in a while—under conditions of great difficulty. Customers must not be kept waiting, he was told, and therefore he was often called away from his compounding a half dozen times on one prescription to sell cigarettes, sodas and patent medicine. The pharmacist is human. Can a prescription filled in this atmosphere of interruption and hurry be accurately compounded? How can the pharmacist remember where he left off?

It is enlightening once in a while to see ourselves as others see us. That is why this article was written.

GENERAL NEWS.

All who know Edward V. Sheely, an ex-member of the Tennessee Board of Pharmacy and very active in the N. A. B. P. some years ago, will be glad to hear that he has been appointed acting postmaster of Memphis. Mr. Sheely must pass a civil service examination before he can receive a permanent appointment, but those who know him are confident that he will qualify when the examination is given.

Mr. Sheely is very active not only in local civic affairs, but also in pharmaceutical circles, being President of the Tennessee Pharmaceutical Association and the Tri State Pharmaceutical Association, and Past Vice-President of the AMERICAN PHARMACEUTICAL ASSOCIATION.

A complete history of the Texas Board of Pharmacy is published in the March issue of the *Southern Pharmaceutical Journal* under the title "Something about the Past and Present of Pharmaceutical Examiners of Texas." It was written by Margaret Cousins and is illustrated with splendid pictures of individual members and board groups.

The example is a worthy one for other boards to follow. It would be a comparatively easy matter to start such a history of the activities of the board of pharmacy in each state now; in later years, it would be more difficult to dig back to the beginning.

The separate state histories could be combined into a unit, and, with the history of the N. A. B. P. since its inception added, a complete record of the work of the boards of pharmacy in the United States would be available.

STATE BOARD NEWS.

Alabama.—No definite date has yet been set for the next board meeting.

The Alabama State Association will hold its annual convention on a steamship out of Savannah bound for New York. The vessel sails Saturday, June 9th. Reservations are coming in rapidly to President Hal E. Duncan of Birmingham.

Arizona.—More N. A. B. P. applications will be given consideration at the April 18th meeting of the board than ever before in its history.

An examination will also be held on that date and about 20 candidates are expected from California coast towns. (Since California cannot establish reciprocity with other states under its law, many candidates are taking examination in nearby states to have the privilege of reciprocity later.)

Colorado.—As a result of the January meeting, at which 100 candidates were examined, 18 assistant licenses and 18 full registered certificates have been issued. The next examination will be held in Denver at the State Capitol, May 18th and 19th.

The thirty-fourth annual report of the Colorado Board (year ending July 2, 1927) has just been issued. During the period covered by the report, 139 candidates appeared for examination for registered pharmacist certificates and 24 for the assistant grade. Of these, 29 (21%) of the former and 17 (17%) of the latter were successful in making the required grades.

A record of grades made in the various subjects indicates that whereas Materia Medica has heretofore always been the easiest subject of the examination, it has yielded this year to chemistry; and pharmaceutical arithmetic, which has heretofore been the most difficult subject has risen to second place, the average grades in pharmacy being about ten points lower than the mathematical subject.

Twenty-seven applicants were registered by reciprocity from the following states:

Illinois	2	Maryland	1	Nebraska	4	Pennsylvania	1
Indiana	1	Michigan	1	New Jersey	1	Washington	2
Iowa	3	Minnesota	2	Oklahoma	1	West Virginia	1
Kansas	2	Missouri	2	Oregon	1	Wisconsin	1
				Wyoming	1		

A sample set of examination questions is published in the report; a list of registered and assistant pharmacists and apprentices of the state; a directory of proprietors and managers of stores; a complete digest of pharmacy, poison and narcotic laws, as well as rules and regulations of the board on these subjects.

Idaho.—The Department of Law Enforcement reports that a special effort has been made during the past month to require all stores that do not have a registered pharmacist in their continuous employ to remove signs advertising drugs.

The Internal Revenue Department is also coöperating by refusing to issue any more permits or renew old permits except to those who are licensed and in good standing. Under Section 5 of the Harrison Narcotic law some non-licensed men have been receiving permits in the past.

Kansas.—The Kansas Board of Pharmacy was entertained in a most sumptuous manner at a banquet given by Joe F. Demain, Treasurer of the board, at the Crescent Hotel, Macksville,

his home town. The occasion was in honor of two retiring members—John Schmitter of Gypsum City and N. G. Edleblute of Topeka. There is a universal appreciation of the fine fellowship that marked the association of these men on the board.

Kentucky.—The ownership bill was defeated by three votes in the Kentucky legislature.

A bill imposing a sales tax on cosmetics was defeated, as was also a bill requiring the board of pharmacy to employ only registered pharmacists as inspectors.

The quarterly meeting of the board will be held in Hopkinsville, April 10th.

Massachusetts.—Following the good example of Pennsylvania, the Massachusetts State Pharmaceutical Association has presented a bill to the legislature with provisions similar to the Pennsylvania ownership law. It prevents chain owners, unless licensed as pharmacists, from acquiring new stores.

A surprise complimentary dinner was recently tendered to Charles W. King, Secretary, by his colleagues on the board of pharmacy. The place was the private dining room of the Copley Plaza Hotel, Boston, and a few ex-members of the board and other guests were invited. A fine electric wall clock was presented to Mr. King as a memento of the occasion. He has recently been appointed for another five-year term on the board.

Nebraska.—The Public Welfare Department has been strictly enforcing the new law restricting the sale of aspirin to registered pharmacists. It is likely that the validity of the law will be tested in the courts, as a number of those prosecuted under the act are questioning its constitutionality. The decision of the Minnesota Supreme Court upholding a similar law in that state should be of great assistance in winning a verdict favorable to pharmacy.

New Mexico.—The next meeting of the board will be held at Albuquerque on May 21st and 22nd. Both an examination and a business meeting will be held. From the way applications have been coming in up to this time, it looks as if there will be a record attendance.

Oklahoma.—Of the twenty-eight candidates taking the recent examination twenty were successful in passing, one being a woman.

Pennsylvania.—Another victory on the ownership law was scored, when the Court of Common Pleas upheld the constitutionality of the act in the case of the George B. Evans Co., owner of a chain of stores in Philadelphia. Both the Liggett Co. and the Evans Co. have stated that they will appeal to a higher court.

At the examinations held January 19th, 20th and 21st by the Pennsylvania Board of Pharmacy, there were 141 candidates for pharmacist registration and 171 candidates for assistant pharmacist registration. There were 62 pharmacist certificates granted and 31 assistant pharmacist certificates issued.

Rhode Island.—Charles Gilson of Centerdale was reëlected President of the Rhode Island Pharmaceutical Association at the annual meeting held in Providence on January 11th. This will make his second year of service in that capacity.

Mr. Gilson is a member of the board of pharmacy and attended the N. A. B. P. convention in St. Louis as its delegate, presenting the application for membership from Rhode Island in person.

Utah.—The results of the examination at Salt Lake City January 17th and 18th have been announced—seven out of nine candidates writing the examination were successful.

Vermont.—On January 31st, Governor Weeks re-appointed Fred D. Pierce of Barton a member of the board for a term of five years to succeed himself.

Virginia.—The bill to abolish the issuing of registered assistant pharmacist certificates which was pending before the legislature, as reported in the last issue, was lost in the senate on March 9th by three votes.

The annual meeting of the board of pharmacy will be held on Monday, April 30th, and officers will be elected for the ensuing year.

The governor has as yet made no appointment of a successor to W. L. Lyle of Bedford, whose term expired on March 1st. Mr. Lyle holds over until his successor is appointed.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

PHARMACEUTICAL EDUCATION MAKES PROGRESS.

C. B. JORDAN.[1]

In the early history of pharmaceutical education, as in the history of most professional education, individuals who were vitally interested in securing well-prepared practitioners organized colleges of pharmacy. This is especially true in the larger cities where groups of retail pharmacists, who were public spirited, joined together and often gave freely of their meager funds to launch a program of pharmaceutical education. Sometimes county associations were responsible for the organization of the colleges. These early colleges were interested primarily in giving professional education and, naturally, their early curricula included only the courses that were directly applicable to the work that their graduate was expected to do.

Many years later some of the state institutions saw the need of professional education in pharmacy and organized departments, colleges of pharmacy or schools of pharmacy within the state university. This was the first attempt of pharmaceutical education to secure support from the people. This movement rapidly advanced and to-day we have a considerable number of state universities that are giving instruction in pharmacy.

The American Conference of Pharmaceutical Faculties was organized in 1900 for the purpose that its title indicates, that is, a Conference. The leading schools of pharmacy in the United States held membership in this Conference and at the annual meetings exchange of opinions assisted much in the development of our professional education. It is but natural that representatives of the two distinct types of institutions mentioned above should clash in their opinions and if the annual Proceedings of this Conference were read from 1910 to 1920, this clash of opinion would be readily discovered. Out of these discussions has grown a decided advance in pharmaceutical requirements.

The first advance was made in 1920 when the minimum requirement was changed from one year of high school to two years of high school. After this first step was taken the advance became rapid. In 1923 the minimum requirement became that of high-school training or its equivalent. In 1925 the old two-year course was eliminated and the three-year course adopted as a minimum. At the last session of the National Association of Boards of Pharmacy a motion was passed to the effect that, beginning in 1932, a minimum requirement of a four-year course will be necessary for recognition by the N. A. B. P. At the same time the American Association of Colleges of Pharmacy accepted a resolution adopting a minimum four-year course in 1932. According to the By-Laws of this Association this resolution must lie on the table for a year and will come up for final action at the next annual meeting. No one can say what the Association will do with

[1] Dean Purdue School of Pharmacy.

this resolution but, considering the action of the National Association of Boards of Pharmacy, it will be difficult for the American Association of Colleges of Pharmacy to fail to pass the resolution.

The above indicates a rapid progress—more rapid I believe than the progress made by any other professional educational program. Since pharmaceutical education lagged behind its associates it was but natural that the progress of advancement should be rapid, once it was begun. As soon as the first step was made no group or class of pharmaceutical colleges was responsible for the advancement, but a unified effort on the part of practically all the colleges continued the advance. Therefore, credit is due to the unified effort of pharmaceutical colleges.

LEGAL REQUIREMENTS.

An advance in legal requirements similar to that of college requirements is recorded. Rhode Island, New York and Pennsylvania were the pioneer states in this movement and were early in securing the passage of prerequisite laws. The past ten years have seen a considerable number of other states following their example. At present there are thirty-two states and the District of Columbia that have secured prerequisite laws or have them enforced by State Board of Pharmacy rulings. This leaves only a few states to join the majority and it is anticipated that the most important of these states will soon secure prerequisite laws. In several cases the state laws have specified that colleges recognized in the state must meet the requirements of the American Association of Colleges of Pharmacy and in one case the law states that recognized colleges must be *members* of this Association. As in the case of the advancement in pharmaceutical education, the advancement in law requirements indicates that pharmacy is rapidly coming forward.

Several colleges of pharmacy have not waited for the American Association of Colleges of Pharmacy to take its next step but have already eliminated their shorter courses and have adopted a four-year course as a minimum. Ohio State University, College of Pharmacy was, I believe, the first to take this step. It was very soon followed by the University of Minnesota, College of Pharmacy; University of Nebraska, College of Pharmacy, and the University of Notre Dame, School of Pharmacy. At a recent meeting of the Deans of the Northwest Colleges of Pharmacy the following institutions have announced that they will, in September 1930, eliminate all shorter courses and adopt the four-year course as a minimum: University of Washington, College of Pharmacy; State College of Washington, School of Pharmacy; Oregon Agricultural College, School of Pharmacy; North Pacific College of Oregon, School of Pharmacy. The Deans of the Indiana Schools of Pharmacy will meet on April 11th to discuss a similar step with the Indiana Board of Pharmacy so that any intended action can be presented at the next annual meeting of the Indiana Pharmaceutical Association.

Throughout this rapid advance in education and in legal requirements the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy have had a very helpful influence and in many cases have taken the forward step. The retail pharmacists of the country are to be congratulated on their forward-looking attitude. In most cases where advance in college or legal requirements has been considered, the retail pharmacists have been quick

to assist and in many cases have been instrumental in taking the step. All of the above indicates that pharmacy has awakened to the need of better training for the profession and that all the interests have been instrumental in securing this better training.

CLASSIFICATION OF COLLEGES OF PHARMACY.

Up to one year ago there had been no organized attempt made to classify the colleges of pharmacy in the country. The American Association of Colleges of Pharmacy has for many years had a Committee on "Investigation of Pharmacy Schools by the Carnegie Foundation" and once a year they have asked this Foundation to undertake the investigation. Each time the request has been denied on the plea of lack of funds. The subject of classification of colleges of pharmacy has been debated many times on the floor of the American Association of Colleges of Pharmacy and of the National Association of Boards of Pharmacy.

INVESTIGATION BY NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

The state boards of pharmacy have had considerable difficulty in considering whether this, that or the other college should be recognized by them. It is a real problem for the State Board and one that must be solved before there can be full, satisfactory and efficient reciprocity by the states. Some boards of pharmacy, notably New York, Ohio and New Jersey have attempted to make their own classification by requiring the individual colleges to be registered in the states before recognition will be granted their graduates. At the last annual meeting of the National Association of Boards of Pharmacy a program of investigation of colleges was approved and it is my understanding that plans for this investigation are now being perfected.

INVESTIGATION OF MEMBER-COLLEGES BY AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

In the early history of the American Conference of Pharmaceutical Faculties, it was recognized that it was only a conference and any requirements passed by the Conference were not held binding except in the good judgment of its members. Later, these requirements were looked upon as binding and finally with the change of the Conference to the status of that of the Association its requirements became obligatory. The Association had no funds to pay for the investigation of its members to determine whether they were meeting its requirements or not. Comment was often made that non-members of the Association were maintaining higher standards than were some of its own members. Whether there was a basis of fact for these comments or not, the Association was unable to determine because it had no machinery for the enforcement of its membership requirements. It was only when a direct accusation was made against a member-college or the violation of the requirements were announced in the catalogs of the member-college that the Association was in position to use any executive action. At times the Association has been criticized for lack of enforcement of its rules and regulations, yet it was helpless except as above mentioned, because of lack of funds.

For many years the Association had a Committee on Classification of Colleges of Pharmacy. This Committee brought before the Association many recommendations which the Association failed to enact, primarily, because of lack of funds

for the purpose. At the last annual meeting the individual who had been Chairman of this Committee for many years was the President of the Association and again recommended the investigation and classification. The Committee on President's Address made the following recommendations which were approved and became part of the program of the Association: "For the purpose of strengthening the morale of our organization, a system of official visits shall be arranged by the Executive Committee, which will be planned so that each member-school shall be visited at least once in three years. These visits shall be made by trusted members of the Association, selected by the Executive Committee from adjacent districts. Reports of these visits shall be sent to the Chairman of the Executive Committee, who shall collate and arrange the material for presentation to the Association at suitable periods upon request."

In accordance with this action the Executive Committee has prepared an official visitation blank calling for certain information as follows:

Name of Institution Examined.
Date of Establishment
Name of Examiner.
Time of Examination.

I. Control, Organization and Internal Administration.

a. Relation of School to parent organization.
b. Does the School enjoy all the privileges granted to similar units in the parent organization?
c. Is the School budgeted? How budgeted? Is the executive officer of the School a member of the budgeting committee?
d. How many separate departments in the School and what relationship exists between them and the School as a whole?
e. Does each department receive its just share of funds for the work it has to do?
f. Comments and suggestions for improvements.

II. Financial Support.

a. How is the School supported?
1. Student fees?
2. Endowment?
3. Taxes?
4. Combination of these?
5. Gifts?
6. Appropriation?

b. What is the tuition fee?
c. What other fees must students pay?
d. What is the total sum received by School per year? (a + b + c)
e. What per cent of total income is derived from (a + b)?
f. What is the student pro rata of total income (that is, quotient obtained by dividing total income by number of students enrolled)?
g. Is the School adequately financed?
h. Is all the expense of the School met by tuition and student fees or is there a deficit at end of year?
i. If there is a deficit, how is it met?
j. Comments and suggestions.

III. Instructional Load.

a. How many clock-hours per week does each instructor teach, or administer laboratory work?
b. How many student-clock-hours per each instructor? (Student-clock-hours are

obtained by multiplying the number of clock-hours by the number of students enrolled in the course (a course consisting of 2 lecture and 6 laboratory hours per week with 40 students enrolled will represent 320 student-clock-hours).)

c. How many student-credit-hours per instructor? (The above courses in most institutions would represent 4 semester hours. Then 4 × 40 = 160 student-credit-hours.)

d. Comment on teaching load and suggestion for improvement.

IV. Faculty. Report on Each Member as follows:

a. Name and age.
b. General training.
c. Professional training.
d. Practical experience.
e. Degrees received.
f. Membership in scientific societies.
g. Hours devoted to School (by this is meant, how many hours per week is the instructor present in school for service to the School)?
h. Other outside regular employment.
i. Professional or scientific publications.
j. Comment on Faculty; suggestions for improvement.

V. Plant and Equipment.

a. Buildings (approximate value of each and adequacy for service to which they are put).
b. Number and size of lecture and recitation rooms.
c. Number and size of instructors' offices.
d. Number and size of general laboratories.
e. Number and size of research laboratories.
f. Are the above rooms modern, well lighted and well ventilated?
g. Size of space devoted to library and reading rooms.
h. Number of volumes in library.
i. Use of library.
j. Other available libraries.
k. Adequacy of equipment for service.
1. Pharmacy equipment.
2. Chemistry equipment.
3. Pharmacognosy equipment.
4. Dispensing equipment.
5. Research equipment.

l. Comments and suggestions for improvement.

VI. Curriculum.

a. How many days per week is each class or section required to be present for instructional purposes?
b. Number of lecture and laboratory hours per student for each course devoted to
1. Pharmacy: Lecture ..... Laboratory .....
2. Chemistry: Lecture ..... Laboratory .....
3. Materia Medica (including botany, pharmacognosy, pharmacology, posology and toxicology): Lecture ..... Laboratory.....
4. Commercial pharmacy: Lecture ..... Laboratory .....
5. Physiology: Lecture ..... Laboratory .....
6. Bacteriology: Lecture ..... Laboratory .....
7. Other subjects: Lecture ..... Laboratory .....

c. Total number of clock-hours in each course leading to a degree: Lecture ..... Laboratory .....
d. Degrees offered and requirements for each. Comments and suggestions.
e. General comments and suggestions.

The Executive Committee of the Association has authorized the following official visits:

1. University of Michigan, College of Pharmacy; Detroit Institute of Technology, College of Pharmacy; College of the City of Detroit, School of Pharmacy. Visits to be made by Dean Edward Spease, Western Reserve University.

2. State University of Iowa, College of Pharmacy, and Des Moines University, College of Pharmacy. Visits to be made by Dean C. B. Jordan, Purdue University.

3. Ohio State University, College of Pharmacy; Western Reserve University, School of Pharmacy, and Ohio Northern University, College of Pharmacy. Visits to be made by Dean C. H. LaWall, Philadelphia College of Pharmacy and Science.

4. Purdue University, School of Pharmacy, and Indianapolis College of Pharmacy. Visits to be made by Dean C. A. Dye, Ohio State University.

5. Philadelphia College of Pharmacy and Science, Rutgers University, New Jersey College of Pharmacy, and University of Maryland, School of Pharmacy. Visits to be made by Dean W. F. Rudd, Medical College of Virginia.

6. Medical College of Virginia, School of Pharmacy; University of North Carolina, School of Pharmacy. Visits to be made by Dean A. G. DuMez, University of Maryland.

7. University of Kansas, School of Pharmacy; University of Oklahoma, School of Pharmacy; and University of Colorado, College of Pharmacy. Visits to be made by Dean R. A. Lyman, University of Nebraska.

Each visitor is asked to submit a report of his official visit to each college to the Executive Committee and a copy of that report to the School visited. Any criticism or comments for improvement that are made by the visitor will then be in the hands of the college visited and of the Executive Committee of the Association. It is expected that these official visits will be of value to the Association but also of value to the colleges visited, especially if these colleges are parts of larger units. These visits will give opportunity for the representative of the Association to meet with the executive authority of the larger units and, if necessary, ask for better recognition and support for the college of pharmacy. The Executive Committee will report to the Association at each annual meeting such items of particular interest to the Association as these visits bring out. It is not anticipated these visits shall present facts for the discipline of member-colleges but it is expected, as outlined in the original action, that such visits will strengthen the morale of the organization.

All of the above indicates that pharmaceutical education and pharmaceutical practice are making very rapid, forward strides and I believe that we, pharmacists, have reason to feel justly proud of the record of the past few years. It would seem, however, that it might be well to pause now for a while that we will be able to get a better perspective of what these advancements mean to our profession. The accusation that we have been going too rapidly never has, to my mind, had a basis in fact because the situation was such that it demanded rapid advancement if we were to retain the dignity and well-being of the profession. However, too rapid advancement may, in the end, defeat the very purposes for which the advancements were made and I, for one, believe that it would be well to pause and *very seriously*

consider any further advancement than that contemplated in the action of the N. A. B. P. and the A. A. C. P. The elimination of our shorter courses and the placing of minimum pharmaceutical education on a baccalaureate level should be sufficient for many years to come. This does not mean that the individual colleges should refrain from taking further forward steps, but I believe it unwise for the A. A. C. P. or the N. A. B. P. to raise the minimum above baccalaureate standing until we have had plenty of time to study the effect of these progressive actions and it will require many years to do this efficiently. Perhaps the time will never come in the lives of most of us when an advance in *minimum* requirements beyond this will be deemed necessary.

THE HIGH COST OF NEGLECT.

BY SAMUEL S. DWORKIN.

I have received many letters from physicians in answer to my article, "Try Your Neighborhood Druggist First," published in many medical magazines. They state the fact that quantities of biological products are being distributed by supply houses, who engage in this business only or, largely, in a commercial way, without any attempt to render a real professional service to the medical fraternity—is the fault of the druggists, because of their neglect in carrying a more complete stock of biologicals, the way of keeping them and because of lack of intelligent information relative to various products handled.

To me, it is only to start all over again. Many years ago, I stated that the neglect of the pharmacist in handling biological products and other modern products is hurtful—as with the advance in modern medication, with the striking new ideas in advertising to the physician, the open propaganda to the public for preventative medicine by various health departments, publications, insurance companies, etc., with pages devoted to articles pertaining to new vaccines and antitoxins in daily newspapers and other publications, creating a condition that the biological products are becoming greater factors in modern materia medica every day. It is a poor excuse for any pharmacist to refuse to supply them with present methods of distribution. Many manufacturers have established distribution depots and jobbers handle these products properly.

The pharmacist is the logical distributor of all medicaments and it should be recognized by every druggist that the physician of to-day is one of the principal guardians of public health and the professional pharmacist is the other. By proper attention to the needs of physicians, a closer bond of coöperation will be established between the medical and pharmaceutical professions.

Only a few words are necessary relative to the care of biological products. Proper care should be given to biological products and to all other medical preparations; special care must be given to biologicals in stock under refrigeration, in checking up the stock of outdated potency and, naturally, prompt delivery of orders. Information relative to the uses, etc., may be had from leaflets and booklets on the subject issued by manufacturers; most of them are not technical; manufacturers will also supply them for distribution among physicians.

The high cost of neglect on the part of the druggist is in the failure to recognize the fact that the physician and public will patronize a pharmacist and will buy everything he carries so long as they feel a professional atmosphere. Dr. LaWall, in "Four Thousand Years of Pharmacy," showed that specialization divorced pharmacy from medicine, but this separation went too far and with the present trend in modernization, the old "drug shop" is becoming a novelty. The various colorful bottles and ointment jars that were once displayed are becoming articles of observation as relics; literature describing the prescription department should receive more attention by pharmacists.

THIRD REPORT OF CONTACT COMMITTEE ON TABLETS.*

The Contact Committees of the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association have submitted to the Food, Drug and Insecticide Administration, United States Department of Agriculture, their fourth report containing recommendations for tolerances on certain medicinal tablets. They have indicated the degree of accuracy within which properly manufactured medicinal tablets can be made under present-day manufacturing methods.

This report covers recommendations on eleven compressed tablets and includes recommended methods of analysis. The tolerances suggested by the combined Contact Committees for the compressed tablets mentioned are as follows:

Acetphenetidin	7.5%	Potassium iodide	6%
Acetylsalicylic acid	7.5%	Potassium permanganate	6%
Ammonium chloride	7.5%	Quinine sulphate	9%
Hexamethylenetetramin	6%	Sodium bicarbonate	7.5%
Potassium chlorate	6%	Sodium salicylate	9%

The proposed standard for Chloramin-Tablets is that they shall contain active chlorine corresponding to 10.3 per cent to 14.3 per cent of the labeled amount of Chloramin-T.

MEASURES FOR REGULATION OF TRAFFIC IN NARCOTICS PENDING IN CONGRESS.

Compulsory treatment of drug addicts in specially designed institutions as proposed by the Interparliamentary Union in Paris in August 1928, is advocated by Mr. Porter. He has introduced a bill (H. R. 11192) proposing to establish two Federal narcotic farms for care and treatment of addicts now confined in Federal prisons. His bill, he said, would admit others than Federal prisoners if facilities are available, and would permit States to board addicts who violate State laws. His proposal, he said, is in line with a suggestion in the President's message to Congress on December 6, 1923, that the Federal Government give more attention to its penal problems.

The Porter bill was referred to the House Committee on Judiciary, so far without action. Another bill (H. R. 12575), similarly referred to the Judiciary Committee, has been introduced in the House by Representative Kindred, of Astoria, N. Y., to provide for a Federal narcotic hospital in New York State, also without action.

FUNDS FOR BUYING DRUGS.

Congress has enacted into law a measure (Public Law 198, formerly H. R. 10083) authorizing advance of funds for the detection of violations of the Federal narcotic law by means of purchase of necessary evidence of such violations. The bill, as it became law, is similar to a bill (S. 3311), introduced by Senator Shortridge, of California, and favorably reported, giving way, however, to the House bill.

The Secretary of the Treasury, Andrew W. Mellon advocated this legislation.

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* See March JOURNAL A. PH. A., p. 257.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

On March 5 and 6, 1928, a joint meeting of the Colleges of Pharmacy and the Boards of Pharmacy of New York, New Jersey, Delaware, Pennsylvania, Maryland and the District of Columbia (comprising District No. 2 of the National Association of Boards of Pharmacy) was held at the Emerson Hotel. The officers and members of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION realized that this joint meeting afforded an opportunity to entertain prominent pharmacists and pharmaceutical educators, and accordingly arranged an enjoyable dinner meeting at the Emerson Hotel, 6:30 P.M., Monday evening, March 5, 1928. Over 100 guests and members of the Branch attended.

President R. E. L. Williamson, of the Retail Druggists' Association of Baltimore, acted as toastmaster for the occasion. The visitors were cordially welcomed by President L. M. Kantner, by Mayor Broening of Baltimore, by Councilmanic Pharmacist S. Y. Harris, by Secretary R. L. Swain of the Maryland Board of Pharmacy, by Dean A. G. DuMez of the School of Pharmacy of the University of Maryland and by Vice-President L. N. Richardson of District No. 2 of the National Association of Boards of Pharmacy.

Dr. H. A. B. Dunning spoke of the wonderful site that has recently been acquired in Washington for the erection of the Headquarters Building of the AMERICAN PHARMACEUTICAL ASSOCIATION.

The following visiting representatives brought greetings, interspersed with delightful reminiscences and timely witticisms: Prof. Louis Saalbach of Pittsburgh, Chairman of District No. 2 for the Schools of Pharmacy; President A. C. Taylor of the National Association of Boards of Pharmacy; Secretary H. C. Christensen of Chicago, of the National Association of Boards of Pharmacy; Dean C. H. LaWall of the Philadelphia College of Pharmacy; Dean Willis G. Gregory of the School of Pharmacy, University of Buffalo; Dean Jacob Diner of Fordham University; Prof. E. Fullerton Cook, Chairman of the Revision Committee of the U. S. P.; Dr. Sullivan, Commissioner of Higher Education of the State of New York; Dr. J. W. Sturmer, Dean of Science, Philadelphia College of Pharmacy; Dean Wm. C. Anderson, Brooklyn College of Pharmacy; Secretary R. P. Fischelis of the New Jersey Board of Pharmacy; and Dean John B. Minehart of the School of Pharmacy, Temple University.

The musical program was presented by Messrs. Nathan Snyder, Violinist, Julius Flescher, Harry Stine, J. S. Blum and I. Saslaw, graduates of the School of Pharmacy of the University of Maryland.

It was indeed a privilege and a pleasure for the Baltimore Branch to entertain and honor the distinguished visitors.

B. OLIVE COLE, *Secretary-Treasurer.*

CHICAGO.

The 173rd meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION

was held Tuesday evening, March 20th, at the Illinois School of Pharmacy, President Gathercoal presiding.

The speaker of the evening was Dr. Paul N. Leech, Director of the Chemical Laboratory maintained by the American Medical Association. He told of the function and purpose of the Council on Pharmacy and Chemistry, its desire to relieve the rather chaotic condition among the proprietary remedies, with the standardization and adopting of a universal product and name for similar or identical products. This work is of particular value to the pharmacist because it creates a greater demand for the official drugs or standardized products which can be used in prescriptions with a greater profit to the pharmacist.

He referred to the tendency in the production of biologic products to control the product by licensing the manufacturer through the supervision of a committee.

Dr. Leech told of the advances made in drugs, explaining the chemical structure of the newer compounds. Thyroxin, the active constituent of thyroid, has been found by Harington to have a different chemical formula than that ascribed to it by Kendall. He told of the work done in obtaining insulin in crystalline form, and the proven value of ultraviolet light.

Ethylene gas is now extensively used in general anesthesia and has also found a new use in ripening fruit. Green oranges and tomatoes are quickly ripened when subjected to ethylene gas. The color of the ripe fruit appears and sugar inversion is accomplished by this method.

Ephedrine was discussed, and the four possible chemical isomers were illustrated with the aid of lantern slides.

The application of the principles of physics has been used in preparing the solution of hexylresorcinol for an antiseptic, the strength of the solution being based on its ability to lower surface tension. The formula and germicidal value of mercurochrome were discussed. The germicidal value is, probably, mainly due to the action of the dye rather than to the mercury it contains. The work in isolating two active principles from pituitary extract was considered by the speaker to be one of the greatest advances in medicine during the past year.

A general discussion followed in which numerous new drugs were mentioned. The value of chlorine and its compounds in medicine has been greatly overestimated, according to Dr. Leech. He was given a rising vote of thanks.

The meetings have been unusually successful and have been well attended.

S. W. MORRISON, *Secretary.*

PHILADELPHIA.

The March meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, March 13th, in the dining room of the Touraine Apartments, 16th and Spruce Streets, President Hendrickson presided. This was the occasion of the annual Past-Presidents' meeting and the outstanding social event of the year. Many ladies were present. During the dinner, Miss Jane Hendrickson pleased the gathering with her delightful singing and by her recitation.

The guest speaker of the evening was Prof. Karl Scholz of the University of Pennsylvania—author, lecturer, traveler and economist. Prof. Scholz gave a vivid account of some of his experiences in Russia during the past summer. He pointed out that there are two classes of people in the United States who know about Russia. The one includes those who feel they know a great deal about Russia, because they have read extensively concerning it; the other, those who feel they know nothing about it because they have actually been there. During his stay in Russia, our speaker was kindly received and had opportunity to study the philosophy of Communism. Because of the inability of the average person, unacquainted with conditions in Russia to understand this philosophy, it is only right that premature judgments should be reserved.

There are relatively few communists in proportion to the vast population, and the training which is required before an individual may become a communist is rather severe. The communist may have forsaken the belief in a hereafter in which he reaps the rewards of his labors, but he has supplanted this by trying to get the best out of this life. "I will" are the words which guide him on. Statues of the Czar Alexander 3rd have been destroyed but there is still one remaining in Leningrad to remind the people of their former oppression. In the rural districts the radio is effectively used to spread the communist propaganda. One of the menaces to the future success of Communism is the fear of war which has been implanted in the very fiber of the people. In one small, squalid village where Prof. Scholz stopped, he was asked "to take the greetings of the peasants of Russia to the peasants of America and ask them not to make war upon us."

Another factor hindering the progress of Russia is the lack of modern methods of manufacture. One candy machine such as is used in this country for salt water taffy found its counterpart in the labor of eight peasants. The building of ships can be done in a far shorter time by some of Russia's near neighbors than it may be done under Communism thus far.

An interesting discussion followed the talk and a rising vote of thanks was extended to Prof. Scholz.

Following this discussion, Dr. Krusen, President of the Philadelphia College of Pharmacy and Science invited the branch to hold its meetings in the new college building located at 43rd St. and Woodland Ave., Philadelphia, Pa.

Since this meeting was the occasion of the annual dinner to the Past-Presidents, who were guests of the branch, we were favored with short addresses by Dean W. A. Pearson of Hahnemann Medical College, I. V. S. Stanislaus of Brooklyn, F. E. Stewart, W. L. Cliffe, E. Fullerton Cook, Ivor Griffith, B. C. Goodhart and J. W. E. Harrison. Charles H. LaWall and Ambrose Hunsberger, also Past-Presidents, were unfortunately called away before the program was completed.

President Hendrickson gave a résumé of the meetings of the past year. J. W. E. Harrison gave the report for the auditing committee and stated that the books showed a satisfactory condition with a balance of $181.32 in a checking account and $409.35 in a separate savings account. Accepted.

J. C. Peacock read the following report for the nominating Committee on Nominations:

President, Adley B. Nichols.
First Vice-President, Elmer Michener.
Second Vice-President, C. Louis Seip.
Secretary and Treasurer, Marin S. Dunn.
Delegate to the House of Delegates, W. L. Cliffe, A. PH. A.

(Signed) C. H. LAWALL.
W. L. CLIFFE.
A. HUNSBERGER.

On motion, President Hendrickson instructed Mr. Goodhart to cast the ballot. Carried.

President Nichols took the chair and after a short address welcomed the other officers for the coming year. During his speech, he called attention to the fact that, as a result of the previous meeting at which the Hon. Clyde Kelly addressed the Branch on the Fair Trade Bill, he had obtained from the Federal Trade Commission six copies of the second questionnaire on price maintenance and that these had been distributed to several prominent members of the Branch. Anyone interested in this problem may obtain a questionnaire by writing to the Federal Trade Commission, Washington, D. C.

MARIN S. DUNN, *Secretary*.

PITTSBURGH.

The regular meeting of the Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held February 28th in the Lecture Room of the Nurses' Home at St. John's Hospital, N. S. About 40 persons were present. President Frank S. McGinnis presided.

After the reading of the minutes the Chair took up the election of officers for the ensuing year. Nominations for officers had been made at the January meeting and further nominations were called for. There being none, the Secretary was instructed to cast the ballots for the nominees as presented by the nominating committee.

The following officers were then duly elected:

President, John G. Rees.
Vice-President, Stephen Wilson.
Treasurer, P. Henry Utech.
Secretary, Louis Saalbach.
Delegate to the House of Delegates, Louis Emanuel.

The program of the evening was presented by a group of senior students of the Pittsburgh College of Pharmacy under the direction of Dr. E. C. Reif. The subject was "The Action of a Number of Drugs and Galenical Preparations on the Isolated Heart Muscle of the Turtle."

In opening the program, Dr. Reif briefly outlined the manner in which the subject was to be presented and introduced the various speakers.

J. A. McCartney discussed the anatomy of the turtle. This was followed by a presentation of the two theories regarding the causation of the heart beat, namely the myogenic and the neurogenic, by Charles A. Janda.

The technique involved in the application of the various remedies was taken up by Richard Steele.

The various speakers then took up the action of the several drugs used in the experiments, illustrating their points by the presentation of charts.

The following drugs were considered by the

individuals indicated: Strychnine Sulphate, by Charles Peebles; Atropine, by Lester Moore; Physostigmine, by Richard Steele, Galinsoga, by J. A. McCartney, and the Heart Tonic Group—Digitalis, Strophanthus and Squill, by Charles A. Janda. Mr. Janda also took up the effect of Aconite and Veratrum.

At the conclusion a vote of thanks and appreciation was extended to the various speakers for the painstaking efforts, during which they utilized upwards of a hundred animals.

A similar vote was extended to the hospital for their kindness in permitting the use of their laboratories, equipment and lecture room.

MARCH MEETING.

The regular meeting of the Pittsburgh Branch of the A. PH. A. was held at the Pittsburgh College of Pharmacy, Tuesday evening, March 20, 1928, with President John G. Rees presiding.

There being no other business to bring before the Branch, the chair presented Dr. J. A. Koch, who entertained the members and visiting guests with a résumé of his recent trip around the Pacific.

During the ninety days that he and Mrs. Koch were out of San Francisco, seventy days were spent upon the water.

Their itinerary included short visits at Hawaii, Samoa, Fiji Islands, Sydney, Brisbane, Macassar, Java, Singapore, Hong Kong, Yokohama, Tokio and other interesting places, returning to San Francisco *via* Honolulu.

Dr. Koch spoke in a general way of the many places visited and also cited many of their peculiar experiences with the strange customs of the peoples of these foreign lands.

He also showed many souvenirs and pictures obtained in the various places visited, and at the conclusion of his two-hour travelogue, assured the audience that the trip was in every way educationally, interestingly and entertainingly worth while.

LOUIS SAALBACH, *Secretary.*

UNIVERSITY OF WASHINGTON.

The regular monthly meeting was held February 24th, at Bagley Hall. President Richards presided. After a brief business report the chair introduced Mr. J. Frank Anderson, manager of the fountain and fixture department of Stewart & Holmes Wholesale Druggists, Seattle, whose subject for the evening was "When and How to Open a Drug Store." His discourse began with the factors involved in selecting a location, followed by the ratio of rent and area available. From this he continued with lighting and display signs, arrangement of fixtures and finally the arrangement of the stock. The talk aroused the interest of the members who then submitted his statements to cross-examination, at the same time asking for more detail. This meeting was considered one of the most interesting of the season.

The Secretary called attention to the fact that the May dinner was to include the celebration of Dean Johnson's completion of twenty-five years as Dean of the College of Pharmacy, University of Washington. Due to the interruption of mid-quarter week and the extra work of finals for the present quarter there will be no meeting during the month of March. H. A. LANGENHAN, *Secretary.*

The Skagit Valley Goldenseal Company of Mt. Vernon, Washington, has established a fellowship ($500.00) in Drug Plant Cultivation in the College of Pharmacy, University of Washington, Seattle. The Company has twenty-eight acres of Goldenseal under cultivation, all under slat shade. Due to the coöperation of Mr. J. A. Boyce, President of the Company, the College of Pharmacy was able to obtain quantities of the fresh and cured drug for phytochemical investigation, this year. Climatic conditions are such that the material may be obtained from the field at any time during the year. This greatly facilitated the investigation of the fresh plant.

DEFINITION OF SPECIALTY IN GREECE.

The Minister of Finance has informed the Department of Customs that for the purposes of taxation the term "specialty" has been defined as follows: Pharmaceutical specialties will be held to include those compound medicaments which are packed in containers bearing the name of the product and its composition, and that the preparations are for direct use and are to be used without undergoing further pharmaceutical or technical process, or admixture with other substances, such specialties being accompanied by a description of their composition, therapeutic indications, as well as directions for use. This definition shall not exclude simple (not compound) medicaments which have a distinctive packing or name, or which are the result of some chemical process, nor those manufactured under patent and which are the specialty of the firm concerned.

CORRESPONDENCE

A CORRECTION.

In an article in the February number of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION entitled, "The Relationship of Medicinal Whisky to the Number of Drug Stores and the Registration in Schools of Pharmacy," I made an inexcusable error in stating that the California College of Pharmacy had a percentage increase in student enrollment this year of only 1.33% over the corresponding period for last year. As a matter of fact this college had a student increase of 35.55% above that of 1926–27 and is, therefore, far from the bottom of the list of colleges showing enrollment gains. I can offer no explanation for the error nor do I seek to give it excuse. I simply blundered in my statement and for this I wish to offer the California College of Pharmacy sincere apologies.

J. G. BEARD.

ALASKA PROGRESS IN PHARMACY.

William Britt, President of the Alaska Board of Pharmacy writes:

"There are many things pertaining to Pharmacy in Alaska that are of interest to the readers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

"When I came to Alaska thirty years ago, we had no laws regulating the practice of Pharmacy. The Alaska Territorial law governing the practice of Pharmacy was enacted by the first Alaska Legislature in 1913. It is similar to the laws of the Western states, adapted, however, to meet the different conditions of Alaska. It has been amended in minor parts to make it more workable. Our By-Laws were adopted in 1914, and have lately been amended to meet the requirements of the National Association Boards of Pharmacy.

"The Alaska Board of Pharmacy consists of eight members, two from each Judicial Division. The members are appointed by the Governor, for four years. The Board elects its own President and Secretary. On account of the enormous distances in the Territory two members of the Board make a quorum in minor cases. Examinations for registered and assistant pharmacists are conducted by the President and any other pharmacist he may ask to assist him. Registered pharmacists from the states are registered in Alaska on approved credentials.

"With the exception of two years I have had the honor of being the President of the Alaska Territorial Board of Pharmacy ever since the Board was established. During these years I have seen the Board gradually overcome many difficulties which we have had to contend with. When the Alaska pharmacy law was enacted it allowed many persons to remain in charge of drug stores who knew little or nothing about pharmacy. It has taken a long time to correct this condition. On account of the immense area of the Territory it is quite difficult for the members of the Board to visit the *circa* 24 stores we have. Beside the drug stores proper our law allows road houses and camps to handle certain drugs or such drugs as the Board of Pharmacy may permit. It can easily be understood that the Board has had no easy task in enforcing the law and bringing the personnel up to the required standard. At the present time our pharmacies are served by men and women who are fully up to the standards of most of the states. We have graduates of pharmacy from many states. These are registered in Alaska on their approved credentials. Many, however, both registered and assistant pharmacists have passed examinations before the Alaska Board of Pharmacy. At these examinations our Board has followed the course of different state boards, especially western states.

"It has always been our aim to give such examinations to our candidates that we could consider them on equal footing with pharmacists of other states. Comparatively few pharmacists are needed, and Alaska has no school of pharmacy. Our candidates are mostly educated at Pacific Coast colleges or by practical work and correspondence schools. We feel gratified that our work has succeeded, and that we are now a member of the Great National Association Boards of Pharmacy."

IOWA STATE PHARMACEUTICAL ASSOCIATION RESOLUTIONS.

Among the resolutions adopted at the Iowa meeting of the State Pharmaceutical Association are the following:

Be It Resolved in conformity with the President's recommendation, that the Legislative Committee make every possible effort to secure the passage of a Pharmacy Ownership Bill at the next regular session of the Legislature.

Resolved, that the Association continue to endorse and support the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists.

Resolved, that the Association hereby condemns the use of the radio in selling merchandise.

The seventh annual Northwest Drug Show will be held in Cedar Rapids early in the spring of 1929.

MINNESOTA PHARMACEUTICAL ASSOCIATION RESOLUTIONS.

Among other actions the Minnesota State Pharmaceutical Association endorsed the following:

That the Legislative Committee be instructed to attempt to have a Drug Store Ownership Law passed similar to the one in force in Pennsylvania.

The elimination of "assistant pharmacist's" examination was approved, allowing those who are now "assistant-registered" to remain in their present status until they pass the "registered-pharmacist" examination.

That the apprenticeship of a graduate of a recognized school of pharmacy who has served under the supervision of a registered full time pharmacist in an accredited hospital dispensary should be recognized by the State Board of Pharmacy.

A recommendation that the dues of the Association be increased from $3.00 to $5.00 was referred to the Executive Committee.

OHIO STATE PHARMACEUTICAL ASSOCIATION ADOPTS CODE OF ETHICS FOR MASTER PHARMACISTS.

Ohio State Pharmaceutical Association has adopted a code of ethics for master pharmacists which outlines in a very practical way the activities of pharmacists. These have been issued in a Circular and distributed to members of the Association, quotations therefrom follow:

"The open exchange of new ideas and methods of master pharmacists and physicians will benefit every member of both professions." "Drug store windows should reflect the professional ability of pharmacists by the display of such items that would not cause offense to either the physician or the public." "The Golden Rule should be applied in handling all matters with the physician, the public and the competitor."

AID OFFERED TO STATES TO ENFORCE DRUG ACTS.

Announcement was made April 6th by the Commissioner of Prohibition, Dr. J. M. Doran, that the policy of the Bureau of Prohibition hereafter will contemplate broader coöperation with state authorities by compliance, in certain cases, with their requests for information concerning Harrison Narcotic Law violations.

The Commissioner's announcement is given in the form of a Treasury Decision (T. D. 26). It follows:

Requests are frequently made of this Bureau by state medical boards, and like bodies, to be furnished with evidence of violations of the Harrison Narcotic Laws, as amended, obtained by narcotic agents, against physicians, druggists and others, for the purpose of aiding such boards, or like bodies, in taking appropriate action where there are violations of their state laws. Under the limitations of Articles 80 and 81, of the Internal Revenue Regulations No. 12, which have heretofore governed the action of this Bureau on the subject, such evidence has not been furnished, but it is now made to appear that, in many cases, to deny such requests is to refuse coöperation and assistance to state officers in faithful efforts, in proceedings under state laws, to punish violators of the Harrison Narcotic Law.

The Commissioner of Prohibition may, therefore, in the exercise of a sound discretion, in the case of any person who has been convicted under the Harrison Narcotic Laws or who has made an offer in compromise thereunder which has been accepted, furnish to state medical boards and like bodies and to state law enforcement officers, upon written request, such information as may, in his judgment, be of assistance to such state officials in the enforcement of their state laws.

EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, GEO. M. BERINGER, H. C. CHRISTENSEN, J. A. KOCH, J. H. BEAL, W. B. DAY, T. J. BRADLEY. *Ex-Officio Members:* C. W. JOHNSON, *President;* AMBROSE HUNSBERGER, JOSEPH JACOBS, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* LEONARD SELTZER, *Chairman of the House of Delegates.*

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THE A. PH. A. HEADQUARTERS.

OUR RESULTS.

A complete campaign organization has been built up in every state of the Union and pharmacists have been given a valuable demonstration of what they can accomplish by organized effort. The campaign has been confined to pharmaceutical interests only.

In this campaign more has been done than ever before to acquaint the general public with the importance of the entire pharmaceutical industry. The campaign has been worth while as an educational effort on behalf of pharmacy.

More than sixteen thousand persons, institutions, associations and firms, representing every pharmaceutical interest of the country, have subscribed to the fund.

The subscriptions total $703,405.88, with every cancellation and loss by death deducted. Of this total, $234,481.03 was subscribed by retailers; $15,400.00 by wholesalers; $188,384.00 by manufacturers and $265,140.85 by all other pharmaceutical interests combined.

The name of each subscriber and the amount of each subscription have been published in editions of the *Headquarters News Bulletin.* It is impossible to enumerate them here in greater detail but it should be added that every state in the Union is represented.

Of the total subscribed, $285,436.50 has been paid in and, as the expenses of the campaign have been paid by the A. PH. A., every cent collected will be used for the purpose for which it was subscribed.

The results obtained were such as to justify a vote on location in 1927. Nine cities extended invitations, and as the result of an elimination vote, with three ballots, in all of which it led, the city of Washington, D. C. was selected.

A wonderful site for the Building has been chosen and purchased. As soon as the location was determined, a Committee on Site was appointed to select the best building site obtainable. After a careful study of the situation, a site on B Street, N. W., between 22nd and 23rd Streets, facing on the new Mall and directly opposite the Lincoln Memorial was recommended, and approved by the Council. On account of its position and elevation, this site commands an unobstructed outlook over the Mall and the Potomac River to the hills of Virginia beyond, and is in full view of the Washington Monument, the Lincoln Memorial and the Arlington Memorial Bridge, now being constructed, which connects the Mall with the Arlington National Cemetery and the main highways leading south and southwest. The site is situated between the National Academy of Sciences and the Naval Hospital Grounds on which the headquarters of the Public Health Service will be located.

The following prominent leaders in American Pharmacy have subscribed $10,000 each to a special fund for the purchase of this wonderful site, in order that the money in hand could be used for the erection of the Building as soon as plans are completed: H. A. B. Dunning, and J. W. Westcott of Hynson, Westcott and Dunning; A. R. Dohme, President of Sharp & Dohme; G. A. Pfeiffer, President of Wm. R. Warner and Company; J. K. Lilly, President of Eli Lilly and Company;

and H. S. Wellcome, President of Burroughs, Wellcome and Company.

A Committee on Plans is now drawing up the general plans for the Building and as soon as this is done, the ASSOCIATION plans to obtain the services of one of the leading architects of the country who will coöperate with the Fine Arts Commission of the Government in designing a building which will be in keeping with its surroundings, so arranged and equipped as to give the maximum service and a fitting memorial to Pharmacy and to those who made it possible.

A special subscription of $10,000 was made by A. R. L. Dohme to provide the equipment for the Research Laboratory whch is to be known as the Louis and Charles E. Dohme Research Laboratory.

Dr. James H. Beal has announced that he will turn over his extensive Scientific and Professional Library to the ASSOCIATION and this splendid collection will form a part of the Reference Library. No monetary value can be placed on this gift which will be of great assistance in building up such a representative library as is planned. Other gifts are expected for the Library and for the Museum.

The Committee which has in charge the expenditure of the fund, now approximately $13,500, that was collected some time ago to erect in the city of Washington, a suitable memorial to William Procter, Jr., the Father of American Pharmacy, has announced that development of the plans for the Headquarters Building are awaited before deciding on the most appropriate use of the Fund in connection therewith. It has been suggested that a memorial in the entrance hall to the Building would be most appropriate.

SUMMARY OF PROGRESS.

Of the $1,000,000 required, $703,405.88 has been subscribed and $285,436.50 has been paid on these subscriptions. The location has been determined, and the site selected and paid for. The equipment of the Research Laboratory has been provided for, a splendid donation has been made for the Reference Library, and the Procter Memorial will probably be placed in the Building.

As an outstanding achievement, the interest of every branch of Pharmacy has been aroused for this great undertaking, the final success of which is now assured.

ADDITIONAL NEEDS.

To complete the fund and to make the undertaking a complete success $296,594.12 in additional subscriptions is required.

All receipts for this Fund are kept in a separate account and the balance above the total cost of the site, and erecting and equipping the Building, will be invested in an Endowment Fund the income from which will be applied to the maintenance of the Building itself and of the activities of the ASSOCIATION conducted therein, in order to insure their permanency—and make the Pharmacy Headquarters Building the service institution which it was conceived and designed to be.

NEW AND NONOFFICLAL REMEDIES.

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

W. A. PUCKNER, *Secretary.*

POLLEN EXTRACTS - HOLLISTER-STIER.—Liquids obtained by extracting the dried pollen of plants with a liquid consisting of 48 per cent of glycerin, 5 per cent of sodium chloride and 47 per cent distilled water.

Actions and Uses.—See Allergic Protein Preparations, New and Nonofficial Remedies, 1927, p. 23.

Dosage.—See Allergic Protein Preparations, New and Nonofficial Remedies. 1927, p. 23.

Pollen extracts-Hollister-Stier are marketed in treatment sets of five vials containing, respectively, 20, 100, 1000, 5000 and 10,000 units per cubic centimeter accompanied by three vials of physiological solution of sodium chloride for diluting the extract; in treatment sets of thirty vials, twenty containing 400, 500, 600, 700, 800, 900, 1000, and ten each containing 1000 units, accompanied by thirty vials of physiological solution of sodium chloride for diluting the extract.

Manufactured by the Hollister-Stier Laboratories, Spokane, Washington. No U. S. patent or trademark.

Alder Pollen Extract-Hollister-Stier; Aspen Pollen Extract-Hollister-Stier; Atriplex Pollen Extract-Hollister-Stier; Awnless Brome Grass Pollen Extract-Hollister-Stier; Blue Bunch Grass Pollen Extract-Hollister-Stier; Box Elder Pollen Extract-Hollister-Stier; Canada Blue Grass Pollen Extract-Hollister-Stier; Cheat Pollen Extract-Hollister-Stier; Common Sagebrush Pollen Extract-Hollister-Stier; Crested Koeleria Pollen Extract-

Hollister-Stier; Dandelion Pollen Extract-Hollister-Stier; Eastern Ragwood Pollen Extract-Hollister-Stier; English Plantain Pollen Extract-Hollister-Stier; Giant Poverty Weed Pollen Extract-Hollister-Stier; Kentucky Blue Grass Pollen Extract-Hollister-Stier; Lamb's Quarters Pollen Extract-Hollister-Stier; Mugwort Pollen Extract-Hollister-Stier; Orchard Grass Pollen Extract-Hollister-Stier; Perennial Rye Grass Pollen Extract-Hollister-Stier; Quack Grass Pollen Extract-Hollister-Stier; Red Top Pollen Extract-Hollister-Stier; Redroot Pigweed Pollen Extract-Hollister-Stier; Russian Thistle Pollen Extract-Hollister-Stier; Sandberg's June Grass Pollen Extract-Hollister-Stier; Sheep Sorrel Extract-Hollister-Stier; Spring Birch Pollen Extract-Hollister-Stier; Timothy Pollen Extract-Hollister-Stier; Velvet Grass Pollen Extract-Hollister-Stier; Western Ragweed Pollen Extract-Hollister-Stier; Willow Pollen Extract-Hollister-Stier.

Pollen extracts-Hollister-Stier are prepared by extracting the dried pollen with a menstruum composed of 48 per cent of glycerin, 5 per cent of sodium chloride and 47 per cent distilled water. The extract is clarified by Berkefeld filtration. The finished liquid is a 1 per cent extract of the dried pollen, each cubic centimeter representing 10,000 pollen units; 1 unit corresponding to 0.001 mg. of dried pollen.

From *Jour. A. M. A.*, Apr. 7, 1928.

PERSONAL AND NEWS ITEMS.

Prof. W. G. Crockett, of the School of Pharmacy of the Medical College of Virginia, accompanied members of the Senior Pharmacy Class to Baltimore, on April 4th. The day was spent in sight seeing and visit to the laboratories of Sharp & Dohme. Later, some of the visitors attended the meeting of the Baltimore Branch at which time the question of price maintenance was debated with students from the Maryland University College of Pharmacy. The decision of the judges favored the visitors, who held that such legislation would benefit pharmacists and the public.

W. G. Ungerer has been elected to the Board of Directors of the French Chamber of Commerce of New York.

Surgeon-General Hugh S. Cumming presided over a meeting of medical specialists, surgeons and technical men, April 9th, for the purpose of discussing cancer research. The medical branch of the Government has long contemplated the project of coördinating the work to be done in attempting to find the cause and cure of cancer and it is hoped that as a result of such meetings progress in the work will result.

Dr. Cumming is now on his way to Europe to attend the meeting of the Health Committee of the League of Nations and the sessions of the International Health Office held under the International Sanitary Treaty of which the United States is a signatory. He is expected to outline his plans for cancer study at these meetings.

Prof. J. G. Beard, of the University of North Carolina, met with a very painful injury to his eye recently. While out horse-back riding he was struck by the limb of a tree which hung low over the road. It was necessary for him to remain in a hospital but recent advice is to the effect that he is getting along very nicely and will soon be able to leave the hospital.

R. R. Hickson, who was elected Secretary of the Kansas Pharmaceutical Association at its 1927 convention, has resigned, accepting a position in Wichita. A. H. King, of Manhattan, Secretary of the State Board of Pharmacy, was the acting Secretary of the annual meeting of the Association at Wichita, April 10th–12th.

R. E. Lee Williamson, for the last fourteen years Manager of the Calvert Drug Co., Baltimore, has resigned to take a position with the Mutual Drug Co., Cleveland, May 1st.

Mr. Williamson has been associated with the drug interests of Baltimore both retail and wholesale during nearly all of his business life and is President of the Baltimore Retail Druggists' Association.

Charles H. LaWall has been elected to honorary membership of the University of Pennsylvania Alumni chapter of the Society of the Sigma Xi. His birthday will be celebrated by the Philadelphia College of Pharmacy and Science on May 7th, and he has also been selected to receive the 1928 Remington Honor Medal.

Ambrose Hunsberger, Vice-President of the A. PH. A. and a former President of the N. A. R. D., was recently reappointed to the office of assistant prohibition administrator in charge of permits for the fifth prohibition district, comprising the eastern district of Pennsylvania and New Jersey. Mr. Hunsberger has served in the capacity of assistant administrator for some time and prior to his recent reappointment to that office he passed a most successful civil service test.

E. A. Sater, Assistant Publicity Director for the A. PH. A. Headquarters, has recently visited the ASSOCIATION office, in Baltimore, going over the work compiled by him during the past six months and discussed plans for future work.

Robert J. Ruth, Chairman of the Pharmacy Week Committee, has been in attendance at several state conventions and meetings of A. PH. A. Branches. April 10th, he delivered a lecture, illustrated by films, on "Sunshine from the Sea," before the student body of the Pharmacy and Dental Departments of the University of Maryland.

The *Northwestern Druggist* comments that as great as was the Drug Show it in no way eclipsed the Iowa Convention proper. The business sessions, arranged by **President Gillespie** and **Secretary Slocum,** were all largely attended and full of interest.

Governor Hammill has re-appointed **George Judisch** of Ames as a member of the Iowa State Board of Pharmacy.

Samuel L. Antonow, Chicago, **E. J. Knowles** of Minneapolis and **E. C. Brokmeyer,** were among the speakers of the Iowa Convention.

South Dakota State Pharmaceutical Association has listed **Dr. James H. Beal** as one of the speakers of its convention during the week of August 14th.

A monument has been erected to the memory of **Isam M. Light** for twenty years Secretary of the Chicago Retail Druggists' Association. Mr. Light died in 1925.

J. A. Riedel, Secretary of the Montana State Board of Pharmacy, has sold his store at Boulder but will continue to carry on his work for the ASSOCIATION.

W. Bruce Philip, Secretary of the Retail Druggists' Association of San Francisco and the Clameda County Pharmaceutical Association, is recovering after having been away from his office for a time on account of illness.

Edward V. Sheeley, well and favorably known as an Association worker has been appointed Acting Postmaster of Memphis, Tenn.

Dean W. F. Sudro was a visitor at the great Northwest Drug Show at Des Moines during the convention of the Iowa Pharmaceutical Association.

President-Elect David F. Jones attended the meeting and participated in the discussions of the Minnesota Pharmaceutical Association and as delegate of the A. PH. A.

Secretary J. W. Slocum of Iowa was a visitor at the Minnesota State Pharmaceutical Association meeting.

Quintus Hoch, Philadelphia, was host at a dinner in his home tendered in honor of **John M. Woodside,** recently a member of the Pennsylvania State Board of Pharmacy.

P. Henry Utech, Meadville, Pa., has donated a number of volumes of Merck's Report and of the Druggists Circular to the Library of the A. PH. A. As stated elsewhere, Dr. James H. Beal has given his library to the ASSOCIATION. It is pleasing to note that the interest in the Library and in the Museum to be established is growing.

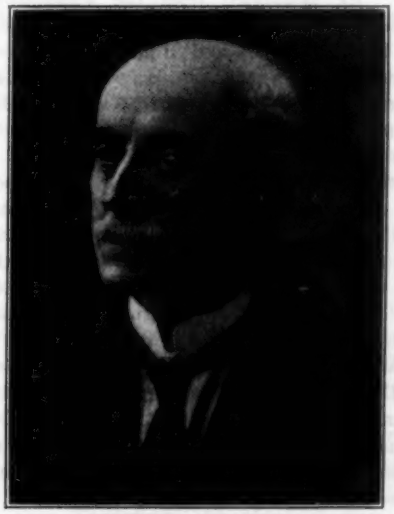
The Havana Evening Telegram (Cuba), of March 13th states that Armand Company, of Des Moines, contemplate the establishment of a factory in Havana.

OBITUARY.

EDWARD AUGUSTUS SAYRE.

Edward A. Sayre, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1877, died March 18th, at the age of seventy-nine years. A sketch will be found on page 77 in the JOURNAL A. PH. A. for February 1926.

As a youth, soon after the outbreak of the war between the states, Edward found employment in a Government hospital in the city of his birth, Newark; later, he engaged with Field & Gassin and then with I. W. Osburn & Co., of Newark. After business associations with William Hegeman, Seabury Pharmacal Laboratories, and on his own account, in New York City, he returned to his home and bought the store wherein he had been engaged about 30 years prior, that of Israel W. Osborne and Ransford W. Vandervoort.



EDWARD A. SAYRE.

The deceased was a charter member of the New Jersey Pharmaceutical Association, its President in 1897 and 1919; also, a charter member of Kings County Pharmaceutical Society, its Secretary in 1879, its President in

1881; a member of its committee on the unofficial formulary which began the work of the New York and Brooklyn Formulary, the predecessor of the National Formulary. His passing leaves only one surviving charter member of the Kings County Society. He was also one of the organizers of Brooklyn College of Pharmacy, of the National Association of Retail Druggists, of New York State Pharmaceutical Association, a life member of New York College of Pharmacy.

Mr. Sayre's participation in developing organizations reflects the man—deeply interested in whatever aided pharmacy, he was genial and considerate of his co-workers. Mrs. Sayre survives her husband, who is mourned by a large circle of friends. The sympathy of the members is expressed to the bereaved.

JOHN C. FALK.

With the passing of Dr. John C. Falk on March third, at the age of 65 years, there was closed a career of well over forty years devoted to the interests of pharmacy as well as medicine. Although his life for thirty-eight years was replete with the duties and responsibilities of a practicing physician, he like all truly great men, was never too busy to further the welfare of his allied interests, such as pharmaceutical and medical education, in which he took an active, constructive part.

Doctor Falk was born in St. Genevieve, Mo., and began the practice of pharmacy in that city. He graduated from the Philadelphia College of Pharmacy in 1884, a gold medalist. In 1890, he graduated from the St. Louis Medical College, later, taking post-graduate courses in the old Missouri Medical College. From 1891 to 1894 he was instructor in Materia Medica in the St. Louis Medical College. In 1895 he assumed the professorship of Therapeutics at this school, which he carried on until 1900, when the demands of his medical practice required all of his attention. He nevertheless took an active part on the board of the St. Louis College of Pharmacy, of which Institution he was elected President in 1912. In addition to these positions he was President of the Medical Society of the City Hospital Alumni, and a member of the American Medical Association, Missouri Medical Association, AMERICAN PHARMACEUTICAL ASSOCIATION, and Missouri State Pharmaceutical Association.

In 1893 he married Rosa M. Plens, daughter of Theodore A. Plens, who died in May 1904. His second marriage was to Ida Curtman, daughter of Prof. Charles M. Curtman, widely known chemist, pharmaceutical and medical educator.

Dr. Falk is survived by Mrs. Ida Curtman Falk and three children: Mrs. Joseph A. Donohue of New York, Mrs. Edward F. Healey of South Bend, and Dr. O. P. J. Falk of St. Louis.

Doctor Falk leaves behind him a record and a memory truly inspirational to all who knew him, and felt his lofty influence. Inherently unselfish by nature, whole-heartedly charitable by principle, uncompromisingly true and sterling, he stands out as chivalrous, generous and true.

William O. Kuebler, President of the Roeber & Kuebler Co., wholesale druggists of Newark, N. J., died April 2nd, aged sixty-eight years. Mr. Kuebler was engaged in the retail business during the early years of his business life and later established the wholesale drug company of which he was the President. He was the founder of New Jersey College of Pharmacy and the following resolutions were passed on April 4th by the college which is now a part of Rutgers University.

"William O. Kuebler was the founder and builder of the New Jersey College of Pharmacy. It is not often that a man is permitted to establish an educational institution, to watch over its growth during his entire active life, and to see it become part of a state university system. He worked purely from a patriotic motive, to advance pharmaceutical education in New Jersey and to afford opportunities of education to deserving youth."

George W. McDuff, aged 54, for more than twenty-five years Secretary of the Louisiana Pharmaceutical Association, died February 24th, following an illness of a year or more. For more than thirty-five years he was in the retail drug business, and for fifteen years was drug inspector at New Orleans. He was for many years Secretary of the State Board of Pharmacy and during the administration of Mayor Andrew McShane, was Secretary of the Board of Police Commissioners. He was highly regarded by the members of the drug trade and will be remembered for his untiring services at the New Orleans A. PH. A. meeting.

Resolutions were adopted by the Louisiana State Board of Pharmacy expressing the high estimate of the services of the deceased and the regard in which he was held by his co-workers. Copies of these resolutions were presented to the widow and son; to the Louisiana State Phar-

maceutical Association; to Arthur B. Parker and to Adam Wirth, life-long friends; to the National Association Boards of Pharmacy, to the A. PH. A. and the membership of the Louisiana State Board of Pharmacy.

Robert A. Wetterstroem, nephew of **Theodore D. Wetterstroem,** Secretary of the Ohio State Pharmaceutical Association, died at the Bethesda Hospital, Cincinnati, following a surgical operation. The deceased was a pharmacist and member of a family of pharmacists. Sympathy is expressed to the bereaved.

Charles Widdrington Tinling, President of the National Drug and Chemical Company of Canada and Vice-President of Palmer's, Ltd., died while on a cruise of the Mediterranean, aged 64 years. Mr. Tinling was not a member of the ASSOCIATION but his close friendship with the late Sir William S. Glyn-Jones brought him in touch with its activities during the Philadelphia meeting.

SOCIETIES AND COLLEGES.

DRUGGISTS' RESEARCH BUREAU.

Prof. Paul C. Olsen, member of the Directing Committee of Druggists' Research Bureau, has made a report on a preliminary study of toilet goods stock simplification in two hundred and fifty-two drug stores, in Philadelphia and New York State. This is published in Bulletin No. 3. Bulletin No. 4 has just been issued by Secretary Newcomb and it contains a complete list of members up to April 1st and represents a membership of about 25,000.

Chairman A. Kiefer Mayer has recently completed the preparation of sixty charts and photographs illustrating the work of the Druggists' Research Bureau, especially as it relates to stock simplification. These charts and photographs have been reproduced as a filmslide. The filmslides may be bought at the Bureau from the Druggists' Research Bureau. It is of interest at Association meetings for reasons indicated.

One of the objects of stock simplification study is to acquaint the druggists with slow-sellers so that they will not overbuy and keep the investment in these items at a minimum so that the profits will not be absorbed by overstock. Another purpose is to acquaint owners of stores with fast-selling items, so that stock may be kept on hand with the lowest possible sales' loss.

Salesmen of wholesale drug houses are supplied with stock simplification census blanks and proprietors are urged by the Bureau to take the subject up with salesmen who will be glad to give assistance in analyzing the stock.

AMERICAN DRUG MANUFACTURERS' ASSOCIATION ANNUAL MEETING.

The American Drug Manufacturers' Association will meet at Hotel Biltmore, New York City, April 30th to May 3rd. The Scientific Section will open on the morning of April 30th; the afternoon will be given over to pharmaceutical matters and crude drug discussions. The biological subjects will be considered on the morning of May 1st, and the first general session will be held during the afternoon of the same day.

The program arranged by W. W. Sykes, Chairman of the Committee on Sales Problems comprises four principal topics: "Territorial Operation" is the subject of J. K. Lilly and the discussion will be led by Dr. F. M. Kirby. Turner F. Currens will give a report on "Drug Trade Advertising." The discussion will be led by R. D. Keim. "Views on Professional Advertising" will be presented by O. J. Neiderhofer, and "Success Factors in Medical Advertising," by Harry C. Phibbs of Chicago.

AMERICAN CHEMICAL SOCIETY MEETS IN ST. LOUIS DURING WEEK OF APRIL 16TH.

The American Chemical Society will convene in St. Louis, April 16th. A symposium of atomic structure valence will be a feature of the meeting, the purpose of which is to acquaint physicists and chemists with each other's points of view.

Dr. Wm. J. Mayo will speak on the advances of learning and medicine through biochemistry. The Division of Chemical Education will be presided over by Prof. B. S. Hopkins, and the Division of Chemistry of Medicinal Products by Chairman A. W. Dox. Meetings of the latter Division are scheduled to begin Tuesday morning.

ANNUAL MEETING OF AMERICAN CONFERENCE ON HOSPITAL SERVICE.

Dr. A. C. Bachmeyer, President of the American Conference on Hospital Service, presided at the annual meeting of its delegates held February 7, 1928.

The constituent members of the Conference represented were: American Association of Hospital Social Workers; American Association of Industrial Physicians and Surgeons; American Dietetic Association; American Hospital Association; American Medical Association; American Nurses' Association; American Occupational Therapy Association; Bureau of Medicine of the United States Navy; Catholic Hospital Association of the United States and Canada; Medical Department of the United States Army; National League of Nursing Education; National Tuberculosis Association; United States Public Health Service; United States Veterans' Bureau.

The AMERICAN PHARMACEUTICAL ASSOCIATION is now a member of the Conference.

In his Presidential address, Doctor Bachmeyer reviewed the work of the Conference from its origin to date, commenting especially on the development of its Hospital Library and Service Bureau, and outlining possibilities of future growth for both the Conference and Library.

The delegates moved that the Trustees of the Conference be requested to make a study of the purpose for which the Conference was organized and, after comparing the purpose with the work already accomplished, to use it as a basis for preparing an outline of future activities which the Conference should foster. This statement, together with plan of procedure for carrying out the work suggested, is to be submitted to the delegates for action.

Dr. Frank Billings was again unanimously elected as *Honorary President*, Dr. Harry E. Mock was elected *President*, Dr. Ralph B. Seem, *Vice-President*, Mrs. Carl Upham Davis, *Second Vice-President* and Dr. Otho F. Ball, *Treasurer*. The Trustees elected are: Miss Evelyn Wood, Dr. John M. Dodson and Dr. A. C. Bachmeyer.

The delegates had an opportunity to inspect the new quarters of the Hospital Library and Service Bureau which have been provided, without rental charge, by the American Hospital Association in its building at 18 E. Division St., Chicago. The American Hospital Association is providing this space, rent free, in lieu of annual contributions previously made.

The Hospital Library and Service Bureau is the property of the American Conference on Hospital Service, and is operated under the direction of that organization.

The following resolution was passed by the delegates:

"*Resolved* that the American Conference on Hospital Service extend a vote of appreciation to the American Hospital Association for their generosity in providing this splendid space for the Hospital Library and Service Bureau and for equipping it with suitable shelving."

At a meeting of the Trustees of the Conference, held February 6th, Dr. Ralph B. Seem, Dr. B. W. Caldwell, Dr. O. F. Ball and Dr. John M. Dodson were appointed members of the Library Committee.

THE GERMAN APOTHECARIES' TOUR OF THE UNITED STATES.

We are in receipt of advice from Editor Hugo Kantrowitz, of the *Apotheker Zeitung* that the German apothecaries who have planned a tour of the United States, numbering about fifty individuals, will leave for this country on May 3rd and expect to arrive in New York City on May 14th. Several days will be spent in visiting in and about New York City and on the 17th members of the party will go to Philadelphia and from there to Washington with a side trip to Baltimore. Several days will be spent in Cincinnati, St. Louis and Chicago. From Chicago a trip has been planned to Detroit and from there to Niagara Falls and Boston, returning for their home journey to New York City on June 7th. It is hoped that a number of the party will remain over and attend the Convention of the A. PH. A.

A FINE SPIRIT OF COÖPERATION.

The desire of State Associations to coöperate is expressed in the formation of the Conference of Secretaries of Pharmaceutical Associations, which will convene during Convention Week in Portland, Me.

Western states have rearranged their dates of meetings so as to make possible visitations of one Association to another and also to give representatives from other organizations the opportunity of meeting with them. This will enable Secretary E. F. Kelly of the A. PH. A. to attend the following meetings: Colorado, Nebraska, Utah, Idaho, California, Oregon, Washington and, perhaps, others. It will also make possible the attendance at some of these state meetings of President C. W. Johnson of the A. PH. A.; Secretary E. L. Newcomb, N. W. D. A.; Secretary H. C. Christensen, N. A. B. P.; General Council E. C. Brokmeyer of the N. A. R. D. This coöperation has been made possible through the initiative of Secre-

tary John Culley, of the Utah Association, with President C. W. Johnson, and other association workers. Aside from exhibiting a fine spirit of coöperation the results will prove of value to all the organizations participating.

DUQUESNE UNIVERSITY.

The third anniversary of the establishment of the School of Pharmacy of the Duquesne University will be celebrated on April 20th. J. Arthur Bornmann has been added to the faculty and is giving a course in business practice. Dr. H. H. Sullivan is instructing the students in first-aid.

UNIVERSITY OF BUFFALO.

The twenty-eighth annual University Day Convocation of the University of Buffalo was held in Edmund Hayes Hall, February 22, 1928. The event marked the dedication of the new building named Edmund Hayes Hall in memory of General Edmund Hayes whose generosity made possible the construction of the building. This Convocation was the first public function held in the new auditorium.

Students in the University of Buffalo School of Pharmacy recently enjoyed a splendid illustrated lecture on, "Immunology and Serum Therapy" given by Robert J. Ruth. This lecture was the first in a series to be given during the second semester by specialists in various subjects allied to the practice of Pharmacy.

On Saturday evening, March 10th, T. G. Williams, a graduate of the School of Pharmacy, University of Buffalo, delivered a very interesting talk on the subject, "The Place of the Druggist in the Community." This talk was one of a series, broadcast every Saturday evening at 7:30 and sponsored by the University of Buffalo Alumni Association.

Dean Gregory attended the recent sectional conference of members of Boards of Pharmacy and teachers in Schools of Pharmacy held in Baltimore.

BOOK NOTICES AND REVIEWS.

Pharmacotherapeutics. By SOLIS-COHEN AND GITHENS. Publishers, D. Appleton & Co., New York. Price, $15.00. Even a superficial examination of the work before us reveals that it is different from the ordinary run of books. While we cannot perhaps concede the claims of the publishers to its being "the most exhaustive and at the same time the most practical single volume presentation in the English language" we do not hesitate to state that this is certainly the most comprehensive and practical work on drug therapy in English. This work which has, for convenience, been gotten out in a single volume of 2009 well-printed pages of text, on fine thin paper, could easily have been edited as a system of pharmacotherapeutics in two or three volumes, of the sort that are usually published by medical book houses. The present form, however, makes it extremely handy and useful as a reference book for the physician, the student and the pharmacologist.

The present work is unique especially in one respect which can be described best by quoting a paragraph from the preface. "In this work the endeavor has been made to set forth what is known of drug action—pharmacodynamics—as ascertained by exact methods of study, and to emphasize the uses of drugs that may be based thereon; but also to call attention to empirical measures not based on known pharmacodynamic data, but having reasonable evidence of usefulness. For this and other reasons, the drugs here discussed have been classified according to their chief uses—in the main, a clinical classification, having in view the needs of practice, but always with due regard to chemistry and pharmacodynamics."

This is a joint work embodying, on the one hand, the experience of a widely known practitioner of medicine who has specialized on the subject of therapeutics, and, on the other hand, of a pharmacologist of equally well-known and well-established reputation.

We find here the latest information on pharmacodynamics side by side with an abundance of empirical data which are of immense value to every one who is interested in the treatment of disease by means of drugs. The work can be spoken of as encyclopedic in character because in addition to clinical and pharmacological data a great deal has been incorporated bearing on other medical series as well as of chemistry, physics and history of medicine. Thus for instance under the chapter dealing with Drug Influence the author gives a description of physical chemical facts bearing on such phenomena as Osmosis, Electrolytic Dissociation, Hydrogen-Ion Concentration, Behavior of Colloids, Enzymes, etc. In addition to the ordinary pharmacological data to be found in most textbooks we find here an extensive and instructive discussion of chemical

structure bearing on various drugs. Thus, for instance, as we turn over the pages we find the chemical structural formulas of various alkaloids, anthelmintics, essential oils and other drugs. We note the constitution and structure of Cantharidin, Santonin, Pyrethrum, Ascaridol, Aspidin, Filmaron, Chaulmoogra oil, Pinenes Terebenes, etc., many of which are not to be seen even in textbooks of pharmacology.

The classification followed in this work is a rather novel one, especially as regards the nomenclature employed. The authors divide the remedial agents into three groups or orders. The first order bears the heading of Antipathogens and deals with remedies used to combat the causes of disease. Here, of course, are included antiparasitic agents, antiseptics, biological antipathogens such as viruses, antitoxins, etc., and the classical chemotherapeutic drugs. The second order is spoken of as Tissue Alterants and includes a discussion of drugs employed chiefly for their topical effect. In the third order the authors include all kinds of drugs which they describe as Function Modifiers. Here are treated drugs acting on the alimentary cause, drugs acting on the blood, and blood forming organs, drug acting on the cardiovascular system both of the stimulating and depressant type, drugs acting on the respiration, drugs acting on the metabolism, drugs affecting the body temperature, drugs acting on the genito-urinary organs, drugs acting on the skin and appendages, drugs affecting the nervous system, etc. This last order is, of course, a very comprehensive one and may be challenged by pharmacologists as well as clinicians as inappropriate. Many would be inclined to classify such agents as the digitalis bodies, the endocrine products, etc., as reagents affecting the etiological or causative factors producing disease. The classification, however, is of small importance.

It is the description of the therapeutic properties of the various drugs that is of special interest in the present work.

The great or leading drugs employed in pharmacotherapy have certainly received full and adequate attention. The discussion of digitalis bodies covers some thirty-six pages and the authors have also given an excellent résumé of other groups of heart drugs including some of the very recent developments along that line such as cardiazole, and various newer camphor derivatives. The Materia Medica of Ferrum alone covers eight and a half pages. A discussion of mercury extends from page 656 to 712. A great deal of attention is given to the consideration of chemotherapeutic properties of such heavy metals as antimony, bismuth, lead and arsenic and even the rarer members of this group such as tin, nickel and vanadium, etc., are also briefly mentioned.

The work is replete with information not only on therapeutics but also on toxicology a subject which, of course, cannot be separated from any complete pharmacological discussion. There is even a section dealing with poisonous war gases. True to their purpose of presenting not only well-established pharmacodynamic remedial agents but also empirically useful drugs the authors have devoted a good deal of space to a description and discussion of substance not usually receiving much attention in other texts. Thus, for instance, the astringents cover some thirty-six pages including, a very full Materia Medica. There are a great many valuable and historical notes and allusions which lend an additional interest to the reading matter. Thus, for instance, a discussion of various medical cults such as homeopathy, eclecticism, etc., can be found here. There is also a useful discussion on such general subjects as dosage, conditions affecting action, indications and contraindications to the use of certain drugs, the employment of chemicals or drugs for testing of liver function, kidney function, etc., and last but not least one other gratifying feature, namely, an adequate discussion of pharmacy in relation to therapeutics which the authors say is too much neglected by both medical men and medical schools. An appendix contains table embodying such information as is usually found elsewhere, weights and measures, temperature scales, incompatibilities, treatment of emergencies, Latin terms and abbreviations, and also a copy of the Federal Narcotic Laws. We cannot give too great a praise to this work, both in respect to the information it contains and also because of the unique attitude of the authors referred to in the beginning of this review, namely, in combining scientific pharmacology with useful clinical empiricism, which latter is one of the greatest sources of material at the disposal of the true scientist to be drawn upon for further investigation. It is a pity that the authors did not include a full bibliography, but that would have made the work very much more bulky, and the authors have in part contributed in this respect by quoting the names of well-known authorities along with the text.

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